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PROCEEDINGS

OF THE

AMERICAN ASSOCIATION OF MUSEUMS

VOL. II

1908

THE AMERICAN ASSOCIATION OF MUSEUMS IN THE ART INSTITUTE OF CHICAGO, MAY 5, 1908

PROCEEDINGS

OF THE

AMERICAN ASSOCIATION OF MUSEUMS

RECORDS OF THE THIRD ANNUAL MEETING
HELD AT CHICAGO, ILLINOIS

MAY, 5–7, 1908

CHARLESTON, S. C.
1908

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PAUL M. REA, SECRETARY
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CHARLESTON, S. C.

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AMERICAN ASSOCIATION OF MUSEUMS

1908–1909

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PROPOSED NEW FIELD MUSEUM OF NATURAL HISTORY, CHICAGO, ILLINOIS

PROCEEDINGS

OF THE

Third Annual Meeting

OF THE

American Association of Museums

HELD IN CHICAGO, ILLINOIS

May 5-7, 1908

SESSION OF TUESDAY, MAY 5

Morning

The opening session was called to order in Fullerton Hall of the Art Institute of Chicago, at 10 o'clock by President W. M. R. French, Director of the Institute.

President French.—"I now pronounce the annual sessions open. I regret that it does not fall on me to pronounce the welcome, which I could so heartily do, but since I am a guest, as well as a host, it is thought more graceful that the president of the Art Institute of Chicago should bid you welcome. I therefore have the pleasure of introducing Mr. Charles L. Hutchinson, president of the Art Institute." (*Applause.*)

Mr. Charles L. Hutchinson.—"Mr. President and Ladies and Gentlemen: As president of the Art Institute it gives me great pleasure to bid you welcome, and to say to the members of the American Association of Museums that all we have we freely offer for your comfort and enjoyment while you are with us.

"Your organization is a very timely one, for the museum is now no longer regarded by the intelligent people of our country as a luxury intended for the few, but as a necessity demanded by the many. It is now called to play a very important part in education and in the advancement of civilization among all people.

"Its installation and its administration are of vital importance, for upon these in a large measure depends the value of any museum to the community in which it exists. Its function is three-fold: To collect, preserve, and disseminate knowledge and to furnish or afford a healthful pleasure. If it properly fulfills its mission in this respect, its attitude must be one of universal hospitality. Not only should it welcome all who come, but it should employ every legitimate means at its command to bring people to it. Its treasures should be accessible to the public with as little restriction as possible and, in its administration, rules and regulations should be reduced to the minimum consistent with the care and safety of the objects shown. Our experience teaches us that the public can be trusted and that it will respect confidence placed in it. The museum that becomes a mere warehouse for the safe-keeping of objects is, as you all know, of very little value to any community.

"But I was not invited to read a paper before you on the ideal museum and its inspiration and installation, but simply to say a brief word of welcome. True hospitality does not exalt the host nor seek to exploit his treasures and so I will refrain from telling you of the many things that you may expect to find in our libraries and museums. I will only assure you that you will find in each and every one of them, as you have found here, a most hearty welcome and God-speed, and a cordial invitation to come again." (*Applause.*)

President French.—"In behalf of the Association, I will ask Mr. Lucas to respond. Mr. Lucas, as you know, is the Curator-in-chief of the Museums of the Brooklyn Institute of Arts and Sciences." (*Applause.*)

RESPONSE TO ADDRESS OF WELCOME

Mr. Frederick A. Lucas.—"Mr. President, and Members of the Association: We are all familiar with the manner in which Chicago, through her citizens, responds to the demands made upon her. Most of us are old enough to remember how she rose from the ashes of her great fire with the tallest buildings the world had seen at that time, and thus set the fashion for her elder sister of Manhattan. Later, selected as the embodiment of four centuries of civilization in the western world, the result was the greatest exposition this continent has ever seen. If she is styled as having the dirtiest river in the world (though I think we can beat it in Brooklyn) her response is a drainage canal which bids fair to become one of the great highways of commerce. Styled a great commercial city, her response is in such institutions as the Academy of Sciences,

the Art Institute, the Field Museum of Natural History, the John Crerar Library, and kindred institutions, which have made Chicago a great center of science and art. And so I think none of us is surprised at receiving so cordial a welcome here.

"None the less is it pleasant to be so warmly greeted, and I esteem it a great privilege that it has fallen to me to respond to this welcome. Therefore, as representing the American Association of Museums, I tender to Mr. Hutchinson, on behalf of each and every member of the Association, our sincere thanks for the cordial and courteous welcome extended us." (*Applause.*)

Taking up the regular order of business the roll was then called by Secretary Rea, and the following is a list of the members present, together with the institutions represented by them.[1]

ROLL OF ATTENDANCE

Charles C. Adams, University of Chicago, Ill.[2]
C. E. Akeley, Field Museum of Natural History, Chicago, Ill.
Frank C. Baker, The Chicago Academy of Sciences, Chicago, Ill.
Bessie Bennett, The Art Institute of Chicago, Chicago, Ill.
Elmer E. Blackman, State Historical Society, Lincoln, Neb.
W. A. Bryan, The Bishop Museum, Honolulu, H. I.
C. H. Burkholder, The Art Institute of Chicago, Chicago, Ill.
N. H. Carpenter, The Art Institute of Chicago, Chicago, Ill.
Sir Caspar Purdon Clarke, Metropolitan Museum of Art, New York, N. Y.
Geo. L. Collie, Logan Museum, Beloit College, Beloit, Wis.
George Corliss, The Art Institute of Chicago, Chicago, Ill.
Adolphe B. Covert, University of Cincinnati Museum, Cincinnati, O.
L. L. Dyche, State University, Lawrence, Kansas.
Oliver C. Farrington, Field Museum of Natural History, Chicago, Ill.
Fanny Fisher, State Museum of Natural History, Springfield, Ill.
William Henry Fox, John Herron Art Institute, Indianapolis, Ind.
William M. R. French, The Art Institute of Chicago, Chicago, Ill.
Anna Billings Gallup, The Children's Museum, Brooklyn, N. Y.
J. H. Gest, The Cincinnati Museum Association, Cincinnati, O.
Robert Glenk, State Museum, New Orleans, La.
U. S. Grant, Museum of the College of Liberal Arts, Northwestern University, Evanston, Ill.
Jesse M. Greenman, Field Museum of Natural History, Chicago, Ill.
Delia I. Griffin, The Fairbanks Museum of Science, St. Johnsbury, Vt.
A. H. Griffith, Detroit Museum of Art, Detroit, Mich.

[1] The list of members present is based upon the registration book as well as the roll call.

[2] Present address: Natural History Building, University of Illinois, Urbana, Ill.

E. N. Gueret, Field Museum of Natural History, Chicago, Ill.
C. V. Hartman, Carnegie Museum, Pittsburgh, Pa.
Halsey C. Ives, St. Louis Museum of Fine Arts, St. Louis, Mo.
L. W. Jenkins, Peabody Museum, Salem, Mass.
Otto E. Jennings, Carnegie Museum, Pittsburgh, Pa.
Mrs. Otto E. Jennings, Carnegie Museum, Pittsburgh, Pa.
Robert Koehler, Minneapolis Society of Fine Arts, Minneapolis, Minn.
Charles M. Kurtz, Albright Art Gallery, Buffalo, N. Y.
Elizabeth J. Letson, Buffalo Society of Natural Sciences, Buffalo, N. Y.
Gustave A. Link, Carnegie Museum, Pittsburgh, Pa.
Elsie Lippincott, Field Museum of Natural History, Chicago, Ill.
Frederick A. Lucas, Brooklyn Institute Museums, Brooklyn, N. Y.
Mabel McIlvaine, Metropolitan Museum of Art, New York, N. Y.
Ira B. Meyers, School of Education Museum, University of Chicago, Chicago, Ill.
William C. Mills, State Archæological and Historical Society, Columbus, O.
Roy W. Miner, American Museum of Natural History, New York, N. Y.
Arnold E. Ortmann, Carnegie Museum, Pittsburgh, Pa.
J. H. Paarmann, Davenport Academy of Sciences, Davenport, Ia.
Olaf August Peterson, Carnegie Museum, Pittsburgh, Pa.
Edward K. Putnam, Davenport Academy of Sciences, Davenport, Ia.
C. G. Rathmann, Educational Museum, St. Louis, Mo.
Paul M. Rea, The Charleston Museum, Charleston, S. C.
Elmer S. Riggs, Field Museum of Natural History, Chicago, Ill.
Boyd P. Rothrock, Pennsylvania State Museum, Harrisburg, Pa.
Mrs. Boyd P. Rothrock, Pennsylvania State Museum, Harrisburg, Pa.
Jos. A. Santens, Carnegie Museum, Pittsburgh, Pa.
Remi H. Santens, Carnegie Museum, Pittsburgh, Pa.
Frederick J. V. Skiff, Field Museum of Natural History, Chicago, Ill.
Harry S. Swarth, Museum of Vertebrate Zoölogy, Berkeley, Cal.
Charles R. Toothaker, Philadelphia Museums, Philadelphia, Pa.
Mary Van Horne, The Art Institute of Chicago, Chicago, Ill.
Henry L. Ward, Milwaukee Public Museum, Milwaukee, Wis.
Stuart Weller, Walker Museum, University of Chicago, Chicago, Ill.
C. P. Wilcomb, Hall Museum of Anthropology, Aspinwall, Pa.
W. P. Wilson, Philadelphia Museums, Philadelphia, Pa.
Alicia M. Zierden, Pennsylvania State Museum, Harrisburg, Pa.

At the conclusion of the roll-call President French announced the program for the day, and read an invitation from the Chicago Historical Society to visit its building and examine its collection, and a similar invitation from the Board of Directors of the Crerar Library. A communication from Mr. F. J. V. Skiff, director of the Field Museum of Natural History, was then read, extending on behalf of Mr. Milward Adams, manager of the Auditorium Theatre, an invitation to the members to attend the Wednesday evening performance as his guests; together with

a further communication from Mr. Skiff extending to the members the privileges of the Field Museum of Natural History.

President French then called for the reading of reports, and Secretary Rea submitted the following report, which on motion of Dr. Oliver C. Farrington, Curator of Geology in the Field Museum of Natural History, was accepted and ordered placed on file.

REPORT OF THE SECRETARY

The Secretary begs to report that he has attended to the routine correspondence during the year, about one hundred letters having been written against forty-four for the previous year. The letters have included inquiries concerning membership and the work of the Association, as well as arrangements for the annual meeting. Twenty persons have been proposed for membership, one of whom, Professor F. Gruber, Curator of the Department of Natural History in the Memorial Museum, Golden Gate Park, San Francisco, died before qualifying as a member. The Secretary also regrets to record the death on June 27, 1907, of Mr. Paul Edmond Beckwith, a charter member of the Association. Mr. Beckwith was born in St. Louis, Mo., September 22, 1848. In 1886 he became a member of the scientific staff of the U. S. National Museum and, at the time of his death, he was Assistant Curator of the Division of History of that institution. Mr. Beckwith was the author of several works of an historical nature and was a member of a number of scientific societies. In his death, the Association has suffered a distinct loss.

The Secretary believes that the publication of the Proceedings of the Association and the adoption of definite lines of activity designed to promote coöperation between museums, affords an opportunity of materially increasing our membership during the coming year.

As a part of the arrangements for the annual meeting, the Secretary has endeavored to secure a general expression of opinion concerning various lines of activity open to the Association. A discussion of these matters will be presented in a separate paper.

Fifty copies of the Proceedings in paper binding have been received from Doctor Holland. One of these has been taken as a Secretary's copy for corrections, etc., five have been distributed under the direction of the President, Mr. French, and two have been sent to new or prospective members.

Respectfully submitted,

Paul M. Rea, *Secretary.*

President French.—"Before proceeding with the other reports, I desire to say that it has been impossible to get all the papers beforehand, or even a full list of them. It will therefore be well, perhaps, to appoint a committee on program who shall retire from the present meeting and make out some order of exercises which shall govern this meeting in the submission and discussion of papers. If there is no objection on the part of the assembly I will appoint as such a committee, Mr. Henry L. Ward of the Milwaukee Public Museum, Mr. Halsey C. Ives of the St. Louis Museum of Fine Arts and our secretary, Mr. Paul M. Rea of the Charleston Museum.

"In this connection I may say that I proposed by letter to various members that we should have separate sessions at times of the art museums and the natural history museums. I have been rather gratified to find that in several instances the representatives of the natural history museum have said that they wished we would not separate ourselves from them. We have made no arrangement as yet, and so few fine art papers have been received for submission to this assembly, that we shall scarcely need separate sessions. However, the program committee can judge of that."

REPORT OF THE TREASURER

The report of the treasurer was then read by Dr. W. P. Wilson,[1] director of the Philadelphia Museums, and referred to an auditing committee appointed by the Chair, consisting of Messrs. O. C. Farrington, Frank C. Baker, and N. H. Carpenter.

REPORTS OF COMMITTEES

President French.—"The reports of committees are next in order. I will ask the secretary to name those committees."

Secretary Rea.—"A committee was appointed to take action with regard to the affiliation of this Association with the National Educational Association. Dr. Holland is chairman of this committee, but is not present. Other members are Dr. McGee and Dr. Dorsey, and they also are absent."

President French.—"There appears to be no report from this committee. Is it your will that the committee be continued?"

Mr. Henry L. Ward (*Milwaukee Public Museum*).—"I move you, Mr. President, that the committee be continued."

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[1]For treasurer's report in full, see Appendix.

The motion was put to a vote and unanimously prevailed.

Secretary Rea.—"A committee was continued at the last meeting to endeavor to secure the benefits of the Carnegie Foundation for museum officials. Dr. Holland is chairman of this committee. The other members are Messrs. Bumpus, Osborn, Gilman, Morse, Skiff, McGee, French and Sir Caspar Purdon Clarke."

President French.—"I will make an informal report for this committee. The committee has not been called together. Dr. Holland, the chairman, is, as is well known, very near to Mr. Carnegie. The idea in mind was that we might induce the Carnegie Foundation to recognize museum officers as persons within the scope of the pensions of that fund. It is an extremely doubtful matter, but I think it might be well for us to continue that committee also. Dr. Holland is now in Europe. He will be active, as he has always been, in the Association, and if anything can be done he will be able to do it."

On motion of Mr. Ward, this committee was ordered continued.

Secretary Rea.—"A committee was also continued to endeavor to secure the benefit of second-class postal rates for publications of museums issued at irregular intervals. Mr. French is chairman of this committee, with Dr. Holland, Mr. Lucas, and Dr. Dorsey as the other members."

President French.—"I was not aware until I had received the Proceedings that I was on this committee. I do not think that I was regularly notified. However, that whole matter, I may say, appears to be so discouraging from our experience in our own institution, that I scarcely think it is possible to do anything about it. Is there anybody who can give us any information on that subject, or who has anything to say upon it? I would be inclined to ask that this committee be discharged. I do not think there is much use in continuing it."

Mr. L. W. Jenkins (*Peabody Museum, Salem, Mass.*).—"Mr. Chairman, I move that this committee be discharged."

The motion was not seconded.

Mr. Frederick J. V. Skiff (*Field Museum of Natural History, Chicago*). —"Mr. Chairman, I dislike very much to place myself in opposition to any motion, although it may be in this case that the motion is more one of indifference than active desire.

"In the first place I may say that I am responsible for the resolution which provides for this committee, and that Dr. Dorsey has made some investigations at Washington which it seems do not present an altogether hopeless aspect. It depends, I believe, upon the construction of one

clause in the postal regulations, and it may be that we will have a continuation in some form of an administration whose sympathies are as thoroughly in accord with the dissemination of knowledge as the present one, in which event I think it might be well, especially as there is no one to report for the committee, and as the gentleman who has made the inquiries is out of the country, to allow this committee to continue with the others.

"This question of postal classification makes a great difference in the expenses of some institutions. Of course to those which do not publish, it is of little importance. Those which do have an extensive free list of publications find that it becomes a great burden when they have to pay the postage which an individual would have to pay."

Mr. Jenkins.—"I am willing to withdraw the motion. It was not made from indifference, but I had been informed that the post-office department had refused to entertain any idea of that kind, and for that reason I thought that there was no use in continuing the committee. If, however, there is use in continuing it, I withdraw my motion."

President French then requested that Mr. N. H. Carpenter of the Art Institute of Chicago be put on the committee in his place and that Dr. Dorsey of the Field Museum of Natural History be made chairman. With these changes the committee was then continued, on motion of Dr. W. P. Wilson of the Philadelphia Museums.

Secretary Rea.—"A committee was appointed to coöperate on behalf of this Association with representatives of other educational institutions in an endeavor to secure a repeal of the duty now imposed by the United States Government upon works of art coming from abroad. Mr. French is chairman of this committee."

The chair was here assumed by Vice-president Lucas and President French presented the following report.

REPORT OF THE COMMITTEE ON FREE ART

At the meeting of the Council in New York, 1906, a committee was appointed, consisting of Dr. W. J. Holland, Messrs. Halsey C. Ives, W. M. R. French, George F. Kunz, Edward Robinson and Benjamin Ide Wheeler, to endeavor to coöperate on behalf of this Association with representatives of other educational institutions in an endeavor to secure the repeal of the duty now imposed by the United States Government

upon works of art coming from abroad. This committee was not prepared to report at the last meeting, but was continued.

Your committee begs to report that they prepared a circular for signature by the various art institutions of the country in the following form:

To the Honorable Senate and House of Representatives in Congress Assembled:

We, the undersigned, officers, directors and trustees of art museums in the United States, respectfully petition for free art legislation in accordance with House Bill No. 15268, 1906.

We believe that works of art are not chiefly luxuries, and that the legislation for which we ask will be beneficial from an industrial as well as an educational point of view, for the following reasons:

European cities are rich in works of art, the accumulation of centuries. The workmen living there are consciously or unconsciously influenced by their environment to give mechanical products an artistic touch that makes them attractive in the markets of the world.

In such matters a new country like our own is at a great disadvantage. The remedy, for many years, will be largely in the hands of the art museums. They aim to keep before the public, as an educational influence, the best works of art in all departments. The bulk of their material for this work must be of foreign origin.

It does not suffice that the museums may import directly for their own use and possession without payment of duty. Few of them have much money to spend in that way. They depend largely on gifts, bequests and loans of works of art from private owners, who have paid the duty, though they are doing substantially the same educational work as the museums themselves. Such important aid in the elevation of the public taste, with its beneficial influence on industrial production, would be far more abundant if the tax upon it were removed.

The only industry protected by the duty in question is that of the artists, yet a majority of the best of them are on record as petitioners for its removal.

This petition has received the signatures of the representatives of art museums and organizations throughout the country, and has been sent to Hon. Henry S. Boutell, Representative from Chicago, for presentation to Congress.

The number of institutions which signed it was 33, the number of officers signing, 196.

Printed copies of the petition with the signatures (of which a copy is filed herewith) were sent to all the Members of Congress. Responses were received from 116, including 29 Senators and 87 Representatives. Their answers may be classified as follows:

In favor of removal of duty....	5	Senators	30	Representatives
Favorably inclined	4	"	9	"
Promise consideration	15	"	41	"
Definitely opposed	0	"	1	"
Acknowledged letter, but gave no definite opinion	5	"	6	"
	29	"	87	"

Of 19 members of the Committee on Ways and Means, 6 are in favor of removal or favorably inclined, 4 will give the subject careful consideration, 2 are doubtful and 7 do not answer.

The general impression was that no action would be taken by Congress until there is a general revision of the Tariff.

We have transmitted the information we have collected to Myron E. Pierce, Secretary of the Free Art League, which has its headquarters in Boston, for use in their active campaign.

We hope by perpetual agitation to accomplish our purpose.

WM. M. R. FRENCH,
for the Committee.

Chairman Lucas.—"You have heard the report of the committee on the repea of the duty on works of art. What is the pleasure of the Association?"

On motion of Mr. Ward the report was accepted, ordered placed on file, and the committee continued.

President French here resumed the chair.

Secretary Rea.—"A committee on publication of the Proceedings of the Pittsburg meeting was appointed, of which Mr. French is chairman."

President French.—"I can only say that the Proceedings have been duly published and distributed, and that we have a balance in the treasury. Is it your will that this report be accepted? The committee will naturally be discharged by limitation."

Dr. W. P. Wilson (*Philadelphia Museums*).—"I move you, sir, that the report be accepted and the committee discharged."

The motion was seconded.

Mr. F. J. V. Skiff (*Field Museum of Natural History, Chicago*).—"Mr. President; may I take advantage of a personal privilege and ask that there be incorporated with the formal motion some expression of the appreciation of the very excellent work performed under the direction of that committee, as manifested by the character and appearance of the report. It is really one of the most capable, interesting, satisfactory

and complete reports, especially of running proceedings, that I have ever observed in any convention or society meeting; and I think that while we ought not perhaps to set an example of expressing our gratitude for all the work of our officers, who, to be sure, are supposed to acquit themselves creditably, it perhaps might in this case be considered only just to do so.'

Dr. Wilson.—"Mr. President; I would like to say with reference to this amendment to the motion, if it be considered such, that this work was, as we all know, largely done by Dr. Holland and was contributed to personally by him to the extent of $200. I think that fact ought to be known to the Association."

President French.—"You accept Mr. Skiff's amendment?"

Dr. Wilson.—"I am very glad to accept it."

Mr. Skiff.—"May I add one word more: the explanation of Dr. Wilson, who is always fair and always wise, it seems to me, simply accentuates the suggestion that occurred to me, as I have no doubt it did to all the members of the Association, that there was work done. I am glad to have it brought to the attention of all the members, that it is Dr. Holland to whom we are so much indebted."

President French.—"Are there any further remarks? I should feel some embarrassment in putting this motion, if it were not that it is perfectly well understood that Dr. Holland did all the work and paid a large part of the expense. With this explanation I will put the question."

The question was stated by President French and, being put to a vote, prevailed unanimously.

Secretary Rea.—"I know of no further committees."

There being no new business, Mr. Charles C. Adams of the University of Chicago, presented the following paper:

PEDIGREE CULTURES AND MUSEUMS

I. Heredity as a Museum Subject

It is generally agreed that the greatest biological advance of the past century has been in our conception of evolution, and a knowledge of its facts. The study of its method will undoubtedly be the primary biological problem of the present century. It is also generally granted that heredity is one of the most important factors of evolution. The subject before us is: What relation do museums bear to this important topic

in the case of pedigree cultures of plants and animals?[1] By pedigree cultures is meant that material which results from experimental studies of heredity in which careful pedigree records have been preserved.

My aim is to mention certain conditions which are pertinent to the experimental study of heredity, and to note the relation and value of the resultant pedigree material to the aims and needs of museums and their relation to the public.

It must be acknowledged that very few museums devote any serious attention to the subject, either in exhibits, in efforts to secure pedigree material, or in practical encouragement of research along such lines. It is entirely within the field of legitimate museum activity to emphasize this subject, and hence such neglect is not only unnecessary but particularly unfortunate. If this is true of institutions which strongly champion research, there is even less excuse for this neglect by those museums which attempt to reach an extensive public through emphasis on display, for no subject arouses more popular interest than heredity, and this very interest may be made a new source of support, not only for exhibits devoted to heredity, but also for museum activities in general.

II. The Present Opportunities and Responsibilities

Never before has there been so much interest and activity among scientific men in breeding experiments as at the present time. Several extensive experiments are now in progress which, in all probability, will become classic in biological history. This activity is not limited solely to investigators in pure science, but includes as well many students of economic plants and animals.

In what manner are museums related to the material resulting from such experiments? If large natural history collections are offered for sale, which have been accumulated by specialists who have published extensively, the museums at once see the value of such collections and are active in securing them, either from their present funds or by securing special grants or gifts from wealthy patrons. We do not, however, find a corresponding interest in securing the results of extensive breeding experiments. Furthermore, specialists who build up extensive systematic collections are quite likely to take a special interest in the technique necessary for the preservation of such material,

[1] Attention should be called to the recent book by Prof. J. Arthur Thompson on "*Heredity*" for its great utility and wealth of suggestions and data essential to the planning of exhibits along this line.

and are thus more or less familiar with certain methods of preservation and recording which are current in museums. On the other hand, a large number of those who conduct breeding experiments are not particularly interested or trained in museum technique, and for this reason they do not take the same kind of care and interest in the preservation of their material. This circumstance is particularly favorable for the neglect or even destruction of the resultant material. No taxonomist or paleontologist would think of destroying, although he might sadly neglect, the collections and types upon which his studies were based. Should not the same or similar care be taken of pedigree material? In general this should certainly be done. This is not, however, an argument that such material or collections be made a fetish, as type specimens have become in the minds of some students. But it does mean that greater care and interest along these lines is very desirable on the part of museums if many important series of this kind of "vanishing data" are to be preserved for reëxamination by future students.

III. Methods of Securing the Materials

Of course many practical difficulties are encountered in the preservation of certain kinds of specimens and records. This is particularly true when the specimens are numerous and bulky, and also when they consist of organisms, which, as they grow, obliterate or transform their earlier stages and thus require extensive records, photographs, etc., to make clear their characters and development. Then again, the rapid accumulation of such material, which is the characteristic accompaniment of breeding experiments, makes its preservation a serious problem, and often a burden for the investigator. These and other circumstances suggest methods which may make it possible for museums to secure valuable collections. A few of these may be mentioned as follows:

1. Some system of coöperation, financial or otherwise, which may induce breeders to part with their specimens, records, etc. The expansion of experiments, due to rapid multiplication, makes financial help appeal with particular force to the breeder. Further, museums may furnish skilled preparators, taxidermists, etc., which will not only improve methods of preservation, but also relieve the experimenter of some of his drudgery and allow him more time for reflection. Finally, the burden of caring for the accumulating specimens is likely to seem an unnecessary expense to the experimentalist, whose interests are naturally toward the future, rather than upon what has been accomplished.

2. Purchase of material already produced by completed experiments. This applies particularly to material resulting from the study of certain economic problems.

3. The conduct of experiments by museums themselves in order to utilize local material to supplement collections already on hand, or as a part of their own contribution to the advancement of knowledge.

IV. Advantages of Coöperation Between Museums and Experimenters

There seems to be no reason why individuals and institutions, other than museums, should not give as good care to pedigree material as do the museums themselves. Yet under present conditions, the museums have certain decided advantages. It is worth while to cite some of these favorable results which may be expected to follow from the coöperation of investigators and museums:

a. Because of their permanent character, their definite systems of recording data, their storage facilities, and the constant attention of the curators, the chances of preservation of such collections are greatly increased. As a rule, the investigator loses interest in the old material as the new accumulates and this is a fertile cause of the deterioration of collections.

b. The bulky character of a collection does not burden a museum as it does an individual.

c. The most improved methods of preservation are made available by the skilled preparators and taxidermists of museums. This skill is not usually possessed by the investigator, or if he does possess it, he may not have sufficient time to excercise it, even if he does realize its importance.

d. Museums would be greatly strengthened by the valuable collections and exhibits, and by the closer contact with the public and the investigators, while the preservation of their collections should have a healthy influence upon the accuracy of experimenters.

Before leaving this subject of coöperation, a word should be said which applies not only to students of pedigree cultures, but also to physiologists—both plant and animal—experimental morphologists, embryologists, and many other investigators of biological problems. That word is, that more attention should be given to the preservation of the specimens upon which their scientific conclusions are based.

Summarizing this discussion, it seems evident that there are many reasons why breeders, experimentalists and other investigators should

give more attention to the methods of preparation and permanent preservation of the materials upon which their investigations are based and that museums should be awake to their present opportunities for securing pedigree and other material for records and exhibits; and that the coöperation of the museums and experimenters will greatly increase the quality and quantity of the material preserved.

The next paper was presented by Mr. Frank C. Baker, curator of the Chicago Academy of Sciences, as follows:

THE NATURAL HISTORY SURVEY OF THE CHICAGO ACADEMY OF SCIENCES

At the Pittsburg meeting of the American Association of Museums Mr. Charles C. Adams read a very suggestive paper entitled "Some of the Advantages of an Ecological Organization of a Natural History Museum," and emphasized the value of local natural history surveys. For the past sixteen years the Chicago Academy of Sciences has been carrying on a survey of this character of the environs of Chicago, and the present paper aims to present a succinct account of the work which has already been accomplished as well as that which is planned for the future.

Early in 1892, through the efforts of Prof. William K. Higley, late secretary of the Academy, an organization was formed known as the "Natural History Survey of the Chicago Academy of Sciences." The organization is controlled by a board of managers, consisting of five members of the Academy. It was decided early in the organization to entrust the work to men recognized as specialists and to publish the results of their studies in a monographic manner. The publications were to be known as bulletins and were to be published consecutively; each bulletin, however, was to be a complete report on the particular branch of the work and if requiring more than one report for its completion was to be made in parts.

The following subjects were planned and were placed in the hands of competent workers:

I. The Lichen-Flora of Chicago and Vicinity. By William Wirt Calkins.

II. The Pleistocene Features and Deposits of the Chicago Area. By Frank Leverett.

III. The Mollusca of the Chicago Area. Part 1, The Pelecypoda. Part 2, The Gastropoda. By Frank Collins Baker.

well as to secure space for the placement of original labels, supports representing ground or stones are made of moderate depth where they abut against the case.

These hangers may be used for a great variety of purposes; for supporting wooden brackets where the exhibit of a wet preparation in glass is introduced among specimens attached to the back of a case, or even for joining the limbs to the torso in taxidermic work.

The hangers fit so closely into the sockets that they can move only upward so that it is not essential to take into consideration the equilibrium of the object. When the specimen to be hung is very heavy and its support can not be extended far enough below the socket to produce an outward pull upon it, there is some likelihood of the arm which enters the socket being forced into the wood of the back of the case. This may be somewhat guarded against by placing a piece of thin metal the full size of the socket between it and the wood in order to increase the bearing surface.

As a matter of accommodation, the Milwaukee Public Museum is willing to furnish these to other museums at cost of fabrication and handling, which at present prices is estimated at two cents each for socket and hanger of any one of the four sizes.

President Lucas.—"Are there any remarks on Mr. Ward's paper? I may say that this is an invaluable invention for which I have waited many years, and one which we began to use in the Brooklyn Institute Museum as soon as we could obtain it.

"If there are no remarks on Mr. Ward's paper, the next on the program is a paper by Mr. E. N. Gueret, assistant curator, division of osteology, Field Museum of Natural History, Chicago."

EXHIBITION CASES WITHOUT SHELVES

Considerable attention has been given of late to exhibiting natural history objects in cases without the use of shelves. This has been extensively done in the department of anthropology in the Field Museum, much of this material, such as clothing, baskets, spears, and various implements so different in form and size not being well suited to shelves. The minerals in the department of geology, are exhibited without shelves, each mineral being placed on a base which is fastened to the back of the case, and the label placed on the front of this base.

Most of the corals in the department of zoology are also fastened to the backs of the cases, and are installed without the use of shelves.

When objects of different sizes must be installed together in a case, a much more useful, more economical, and a neater arrangement can be made if shelves are not used; but the greatest drawback has been that this plan of installation, as practiced so far, does not permit of an easy method of rearrangement in case additions are to be made.

I wish now to call your attention to a plan which I have devised, which will overcome this objection—one that is flexible and interchangeable and that will permit of rearranging or adding to the collection as desired.

Flat, iron bars $\frac{3}{4}''$ wide and $\frac{1}{4}''$ thick have holes drilled 4″ apart and tapped for a no. 14 machine screw. Holes are drilled 1′ apart and countersunk for a $1\frac{1}{4}''$ common, flat-headed wood-screw. These bars are screwed horizontally to the backs of the cases from 12″ to 18″ apart.

The brackets are made of flat, structural steel, $\frac{1}{2}''$ x $\frac{1}{8}''$; $\frac{5}{8}''$ x $\frac{3}{16}''$; and $\frac{3}{4}''$ x $\frac{1}{4}''$ respectively. One end is bent at a right angle, making a projection $\frac{1}{4}''$ long, or the thickness of the horizontal bars. A second bend is made at a right angle 2″, 6″, 9″, and 12″ from the first and in the opposite direction. This arm is from 6″ to 14″ in length according to the depth of the case. These brackets fasten to the horizontal plates by a round-headed iron machine screw, the projection on the bracket taking the weight from the screw and also preventing the specimen from turning or overbalancing, the other arm fitting into a socket inserted into the bottom of the base, or screwed to blocks that fit inside of the ledge of the base. By simply loosening and tightening one screw the specimen can be reinstalled in any part of the case. If wanted for examination or class work, it is removed by simply slipping it off the arm of the bracket. Of course the sizes that I have given for the brackets can be changed to meet the requirements of the specimens to be placed on exhibition according to their size, weight, etc.

Where these brackets are to be used in quantity, it probably would be preferable to have them cast, as they undoubtedly could be cast at a comparatively low cost.

Perhaps it is not out of place to mention here the movable screen so extensively used first in the Field Museum by the department of anthropology. These screens were first used for objects with little weight, and when the objects were arranged on the screen it was

between them are swales of a greater or less extent. The dune region supports a peculiar fauna and flora, which, added to the faunas and floras of the other three regions mentioned, forms a biota unsurpassed for variety by any similar region in the central United States.

The underlying rock of the region is Niagara Limestone, which outcrops in the southwestern part of the area and abounds in fossils, showing that this region in Silurian time supported a large and varied marine fauna.

The importance of a natural history survey of a region like the environs of Chicago cannot be fully appreciated until we grasp the fact that slowly but surely the native animal life is being exterminated and if records are not made at a very early date the possibility for preserving the history of the local biota will have passed beyond recall. This fact was never so forcibly impressed upon the speaker as a year or so ago, when he visited a region about four miles north of Lincoln Park, where in former years land mollusks were very abundant in a grove of noble trees, and found the locality covered with modern flat buildings. Not a vestige remained of this little patch of native forest. This is but an example of the changes which are taking place not only in and about Chicago but about other large cities as well, and if we would preserve the history of the original natural resources of these regions we must act at once. Future generations will have to depend on the printed documents and collections made by us of the present generation for their knowledge concerning the indigenous natural features.

With the end in view of not only preserving the local natural history on the printed page but also of handing down to posterity collections representing the actual existing forms of life, the Natural History Survey has planned to have deposited in the Academy a complete collection of each branch of science. Thus far a collection has been made which illustrates each bulletin that has been published. This material is prepared for both exhibition and study. The molluscan collection is the largest and most complete, containing specimens from all of the regions mentioned above and embracing many local geographic variations of great interest. The bird exhibit is next in comprehensiveness and is followed by the paleontological collection. The local rocks, minerals and plants are also systematically arranged and the insect collection contains a large percentage of the local species.

It is the aim of the Survey to make the work as broad and comprehensive as possible and various publications will, as indicated by those already published, deal with the subject from a systematic and ecological as well as an economic standpoint.

It is the bounden duty of every local scientific organization to first make known the material resources of its immediate environment and to prepare such collections as will serve to indicate the nature and extent of such resources. The speaker believes that the natural history survey now being conducted by the Chicago Academy of Sciences is performing this duty, perhaps not as well as might be wished but at least as well as its resources will permit.

Mr. Baker.—"I shall be glad to answer any questions. I think we might have a very interesting discussion of local work. It has been said, I think, by Dr. Goode, that it was the duty of every museum first to exploit its own environment, and then to branch out to other parts of the world, and so, being a small institution and having small resources, the Academy has exploited its own neighborhood first."

Dr. Wilson (*Philadelphia Museums*).—"I would like to ask the speaker what has been done with reference to a study of the early Indian tribes in this region?"

Mr. Baker.—"Dr. Phillips of Evanston has been doing some work of that character. I do not know at the present time what has been accomplished, but the intention was to publish his researches as soon as he had them in shape.'

Miss McIlvaine (*Chicago Historical Society*).—"The Chicago Historical Society has had an opportunity to do something toward a survey of the Indian inhabitants of this locality, having been very fortunate in having among its members a number of men who were fond of the woods, trampers and bicycle riders, and they have gathered the relics that were accessible in the spring, such as lay immediately on the surface. Not only have they arranged these systematically, but they have also made elaborate maps of the localities, some of them going into great detail and showing the exact situation where the particular relics were secured. Such an exhibit as this was purchased last year by the Chicago Historical Society. It has not yet been installed, but a large portion of it can be seen, and it is the intention of the Society to add other collections that have been made by private individuals throughout this region."

Mr. E. E. Blackman (*State Historical Society, Lincoln, Nebraska*).—"Is this chart or map that you speak of to be published by the Historical Society?"

Miss McIlvaine.—"It is to be published by Mr. Albert Scharf, who made the final investigation. The Society will publish a new edition of

looks well. They can be made to hold liquids even in small sizes and with a narrow metal binding, but it is such a difficult piece of work that it is hardly worth while. I think that a flat bottle is the best small container for liquids, but for the larger ones and for the smaller ones not containing liquids, it seems to me that the wooden edges serve very well. I would not recommend the general use of metal edges and other cementing material than glue in the effort to hold liquids."

President Lucas.—"I may say that the papers this morning are interesting as showing how the esthetic side is coming into the question of museum exhibition. Great effort is made not only to have the collections instructive but to have them look well."

Mr. E. N. Gueret (*Field Museum*).—"What is the cost of these containers by the hundred?"

Mr. Toothaker.—"We have not made them by the hundred. We have made them in special sizes and comparatively few at a time in our own carpenter shop, and we have not kept an accurate account of the cost. I am sure that they are very cheap indeed in comparison with the square glass jar of equal quality."

Mr. Charles Louis Pollard, curator-in-chief of the Staten Island Association of Arts and Sciences, then demonstrated a semi-cylindrical exhibition jar provided with flanges on the flat side for the insertion of opaque backgrounds of any desired color. This jar is designed for use with the semi-cylindrical face toward the front. The discussion of this subject proceeded as follows:

President Lucas.—"I would like to ask Mr. Pollard if this jar could not be reversed. If it were made without any flange and turned with the flat side to the front it would occupy just half the space of a round jar and give absolutely no distortion."

Mr. Pollard.—"There would be no advantage in that for it would have practically the effect of the ordinary rectangular jar."

President Lucas.—"You would have half the contents."

Mr. Pollard.—"Yes, it could be done of course."

Dr. Arnold E. Ortmann (*Carnegie Museum*).—"Where are they made?"

Mr. Pollard.—"They are manufactured by a European firm and imported by the Kny-Scheerer Company of New York. I know of no other American agents. The price is not especially high in view of the fact that they are an imported product. I am sorry that I am not able to quote exact figures at present, but, in the long run, they are certainly not any more expensive than the ordinary cylindrical jar. The price is higher than that of the square jars."

Mr. Henry L. Ward (Milwaukee Public Museum).—"I would like to ask whether the distortion in this jar is any less than it would be in the cylindrical jar in which the specimen is mounted on a slab with iron or black glass and dropped into the jar."

Mr. Pollard.—"No, there is no less distortion, but the chief advantage is that the cylindrical glass is unnecessary in this case because you can put your backing of cardboard or other material directly on the outside of the jar and easily remove it. It is unnecessary to have a separate mounting."

Mr. Pollard then read a paper describing a home-made label holder.

There being no discussion of this subject the following paper was read by Mr. Frank C. Baker, curator, Chicago Academy of Sciences:

A METHOD OF EXHIBITING LARGE DESCRIPTIVE LABELS ON THE OUTSIDE OF MUSEUM CASES

One of the many problems of the museum administrator is the proper location of the descriptive label. That the descriptive label is a good and a necessary part of an exhibit there seems to be no question, the problem being where to place it in the case so that it will be conspicuous enough to attract attention and still not be obtrusive enough to mar or to detract from the exhibit. In the museum of the Chicago Academy of Sciences, the cases are all of wooden construction and hence the frames and the door posts are rather large and more or less conspicuous. A little experimentation soon made the fact quite evident that these conspicuous wooden partitions between the glasses of the doors would serve as excellent places for the attachment of large descriptive labels. It further became evident, at least in the vertebrate exhibits, that the majority of the museum visitors needed simply the English name of the specimen, the scientific name and the other more technical details being passed by with but a glance.

With the end in view of making the bird exhibits more useful to the average visitor as well as to the bird student, the labels inside of the cases have been limited to the commonly accepted English name printed in large type and placed directly above the bird. In the exhibit of local birds the descriptive matter is placed on the outside of the cases and consists of a short description of the family, and a

worked out slowly and I hope that this branch of the science will not be neglected, because I am very much interested in anything looking to its development."

Mr. L. L. Dyche (*University of Kansas, Lawrence*) —"The State of Kansas is interested in work of this kind, and especially in one of the famous trails in the western part of this continent, known as the Santa Fé Trail. Certain ladies interested themselves in the matter of marking this trail a few years ago, and caused collections to be taken up from the public schools all over the state, each pupil giving at least one penny At the present time the old Santa Fé Trail is being marked in a manner by which it will always be known, starting at Westport and Atchison and going through the State of Kansas. It had been slowly obliterated by the conversion of vast tracts of land into farms, and in a very short time it would have been impossible to trace its course. It is being well marked, and in time the State Historical Society will publish a pamphlet showing exactly where it went."

Mr. William A. Bryan (*Bishop Museum, Honolulu*).—"I would like to remark that as far away as Honolulu we agree upon the policy of doing things now. Most ethnologists know that the worship of the old Hawaiians took place in a temple which was known as a 'kaow.' Frequently those kaows were located in the very best agricultural land, and as years have gone by we have become more or less mercenary in our agricultural development, and these kaows have been torn down and obliterated to such an extent that we have been very active in preserving their names, history, and locations. The Bishop Museum has done a great deal towards a survey of the kaows of the group. The Historical Society has done much toward collecting the data which accompany that survey, and several hundred kaows have been located definitely and data are being collected. We are carrying the work still farther and locating the kaows on maps of the group, and the Historical Society is assisting in this work by marking or at least locating a great many of these historical points."

Dr. Oliver C. Farrington (*Field Museum of Natural History, Chicago.*) —"I would like to mention one illustration of the need of haste in this matter. For the last ten years I have had my eye on an especially well defined ancient beach of Lake Chicago at 120th and State Streets, with a view to photographing it as a record of the ancient lake. I failed to do this, however, and when I went there last fall, although there had been no houses in that vicinity for all that time, I found it all but covered with newly built houses. Thus, I was just able to get the last record of that

beach That simply illustrates the need of all possible haste even in topographic features, in a great and rapidly growing region such as this."

President French.—"Following the alphabetical order, we will next have the pleasure of listening to a paper on 'The Field of the Small Museum,' by Mr. George L. Collie, curator of the Logan Museum, Beloit College, Wisconsin."

THE FIELD OF THE SMALL MUSEUM

There is a marked tendency in one or two of our north-western states to establish small local museums in connection usually with the town libraries. This movement is commendable, but it needs guidance and direction. Several museums in the same region are engaged in collecting without reference to the work others may be doing. The curators of small museums are not acquainted with the problems of museum administration, nor with the possibilities that lie in coöperation with near or remote museums. The large museums pay little attention to their small brothers. They have all they can do to attend to their own troubles without inviting others. On the other hand the curator of the small museum does not, as he ought, seek advice from those of more experience. The result is that there are a number of museums springing up, each practically duplicating the work of the other and none of them accomplishing what they might did they labor with a common understanding.

I feel very strongly that this association can perform a very useful service by issuing through some committee a bulletin relating to the small museum, giving advice and making suggestions which those of wide experience in the larger fields could so well furnish to their co-workers in the smaller institutions. If the cause of museums is to advance, if they are to fill an important rôle in the field of education, then there must be more coördination in the movement, some central brain must direct matters. This association can do some such work better, perhaps, than any other agency, at least at the outset.

After these preliminaries I would like to set forth what, in my opinion, constitutes the field that these smaller institutions should try to cover, especially those which are connected with an educational institution. They should collect along one or, at most, two lines, making complete local collections supplemented, of course, by all the material that may be obtained from other sources along these special lines. This is not a new idea, but it has been carried out in the museum with which I am connected and the experience there may bear repeating.

It must be remembered that the small museum not only has limited funds at its disposal, but also a small amount of space for exhibition purposes, a small curatorial staff and worst of all it ordinarily possesses a great lot of miscellaneous objects, much of it junk, to classify, catalog, label and exhibit. The museum at Beloit College fifteen years ago may be taken as a typical example. It was housed in a dark, dusty, unheated and locked room measuring 35×65 ft. It contained a small collection of Ordovician fossils, a few minerals, some of them being choice specimens, a lot of rocks accumulated from the Wisconsion Geological Survey, two spool cases of bugs and butterflies, a few birds and mammals, some old crockery, embroidered work made by representative needlewomen of Wisconsin, some silver trophies won by a local fire company and a miscellaneous lot of relics of the sort ordinarily found in such places. It seemed to the curator that such a collection was undignified for a college museum, that it served no useful purpose nor valuable end and that another type of museum should be sought. The materials of the collection were therefore divided among the several departments of the college where they naturally belonged, while that which belonged nowhere was removed to a room by itself. A few arrowheads and stone axes that were found in the rubbish were taken as a nucleus for a new museum, which it was resolved should be one of archæology, and of nothing else.

Our choice of a field was partly determined by local conditions, as it always should be in such cases. Wisconsin is rich in archæological remains and the state offered at that time peculiar advantages for the development of a museum of that character. Then at the very outset the museum was fortunate in securing a friend who was greatly interested in that particular subject, Mr. F. G. Logan of this city, who gave the museum a great impetus by donating the Rust collection of materials from Southern California and Arizona. Then quickly followed the gifts of the Perkins, Elkey, and finally the Ellsworth collections largely composed of Wisconsin artifacts. Mr. Logan also established a good fund for the maintenance of the building and for the purchasing of further collections, the only stipulation being that the income should be devoted to purely archæological purposes. If the college had retained the old general museum neither Mr. Logan nor any man of wealth would have given one copper to it. By making it exclusively a one-idea collection it was comparatively easy to secure the assistance of men interested along similar lines.

As a result of this policy the Logan Museum has a fairly representative general collection from the United States, and a large and complete collec-

tion from Wisconsin. I doubt whether as good a collection in stone and copper from that state will again be gathered under one roof. All this has been accomplished in less than fifteen years and the results in this case at least have justified the position taken at the outset, namely, that it is wise to develop one department of knowledge rather than several, especially when the limitations of the small museum are to be considered.

The question may now be asked: Of what value is such a museum when it is once secured? It is located in a small town of 15,000 inhabitants and in a small college which averages 400 students. It cannot fulfill the purposes of any of the larger museums in any direction. It cannot reach large numbers as an educational agent nor can it be used in any large degree as a research center. What purpose then may it serve? It must be devoted chiefly to the use of the college students. It is true the museum is open several hours a day and it is freely visited by townspeople and their guests and also by pupils in the public schools. Lectures are given on archæology which are open to the general public and every effort is made to bring the public in contact with the museum in a helpful way. Primarily, however, the museum exists for the students of the college. It forms the basis for a course in American archæology open to sophomores and between forty and fifty take the work each year. Such a course could not be given in many American colleges and there are universities where it would not be feasible to offer it, but it has a place in the college curriculum provided there is a good working collection for illustration. It is the presence or absence of a good museum that should settle the question of the teaching of archæology in the college, rather than the pedagogical quibble whether it has a place in the curriculum or not. I have thus briefly outlined to you one solution of the problem of the small museum. In general I believe these institutions would be benefited by following out some such line of definite work, the exact nature of which would be determined by local conditions and opportunities.

Miss Bessie Bennett (Art Institute, Chicago).—"There is one point mentioned by Mr. Collie that in my opinion, from my experience in the Art Institute, would be a very good thing to follow out, and that is the concentration of the knowledge of the larger museums in some form to be presented to the smaller museums. It would take quite a burden from those who have to supply such knowledge in the larger museums, if we had some special place where we could give forth our experiences for

the benefit of the smaller organizations, and it seems to me that the American Association of Museums could do nothing better than to establish some such repository or exchange. Perhaps not so much in the form of a bulletin as in the form of some general place of exchange where the smaller museums could inquire of the larger museums as to their experiences."

Mr. Dyche (*University of Kansas, Lawrence*).—"You provide a course for students in a particular line, but what do you do with them in the other lines? In my experience it is necessary to provide a very considerable number of courses to satisfy the desire of a large number of students."

Mr. Collie.—"That is a natural question to ask, and it is one that I have thought of a good deal. I did distribute the different materials that were found in the old museum, to the different departments of science. But I very much question the desirability of making a museum a general hodgepodge, and in an institution which has small means for its work, it seems to me it is better to develop along one branch of knowledge in a fair way, than to attempt to develop many branches and secure a great many incomplete collections which are practically worthless. That, it seems to me, is what should be done in a small museum; of course, in the larger museums, it is very different."

Mr. Dyche.—"In my position as a teacher and museum worker with the State University, which is at the head of the public school system in the State of Kansas, for the past five or ten years I have been asked by school boards over the State, and State Superintendents and various persons, to give advice regarding the building up of a very considerable number of museums which have been started in what we call in Kansas, 'County High Schools.'

"I advised these workers in small museums in the high schools to commence their collections by securing types of the specimens that can be found within a few miles of the schoolhouse, say within five miles. If they are very ambitious, I advise them to make as good a collection as they can of the county, and with a few of the smaller institutions where their ambitions are very high I have advised them to make as thorough an investigation as they can of the specimens in the State. Being very ambitious myself, I have undertaken to make a collection of the birds of the North American continent. Extending over so much territory myself, I have advised these people to follow the same line that I did, *i. e.*, to first collect types and then orders and families of as many different groups as possible. I think perhaps it would be better to advise them to concentrate all their strength on one line, but I am seeking for information on that point."

Mr. Miner (*American Museum of Natural History, New York*).—"It seems to me there is one great field that has been omitted, and that that field is in connection with the larger museums. Many of these smaller institutions may be located in regions where they have special facilities for making collections of such material as Dr. Ortmann has spoken of, material which is rapidly disappearing from the neighborhood and which must be secured at all hazards. If these small museums should undertake this work I know the larger museums would always be ready to take advantage of such an opportunity to arrange mutually advantageous exchanges. That, it seems to me, is one of the fields which should be covered by the smaller museum."

Dr. W. P. Wilson (*Philadelphia Museums*).—"It would seem to me that this small museum of Beloit College has done a kind of work which is extremely valuable for original research, that is, it has preserved a lot of collections, and it has stimulated persons to aid in obtaining valuable material which might not otherwise have been brought together. It seems to me from what the speaker has said that it must have gathered a large collection from its neighborhood, and for that reason it seems to me it has done important work which any local small museum might be proud of.

"I take it that justice perhaps was not quite done to the other departments of that institution and I do not see how a department of zoölogy can be conducted without the professors accumulating certain lines of illustrative material which might be said to be the nucleus of a museum or not, just as you please, but must be used for daily work, and that idea of course should be stimulated to the utmost for the advantage which comes in the teaching from such specimens."

Mr. A. H. Griffith (*Detroit Museum of Art*).—"It seems to me that a museum as just described would be like a college which proposed to make all preachers or lawyers or all doctors. There are medical colleges, and there are colleges of law, and there are colleges for ministers, but in a college where you do not thus specialize, it seems to me that a small museum cannot confine itself to one line and be of value to all the students. That is too much like the teaching of art in our public schools, which I look upon as largely a failure for the simple reason that it is teaching the artist only, forgetting that in a room of sixty or one hundred pupils there are brick masons, stone masons, carpenters, blacksmiths, cabinet makers and possibly one artist. Now, to be of value to that whole school, it seems to me that the teacher ought to be a person of the widest possible experience, one who could today give a lesson to the

sign painter and another to-morrow to the designer and possibly the next day to some other tradesman or craftsman, and not confine the work of the school or the facilities of the school to any one line.

"Now, a small museum may develop along a certain line, but it certainly ought not to discard all the other material that is brought to it. In my opinion it should receive that material and keep it until such time as some historical or scientific society or some organization interested in that particular branch desires to care for that material, which otherwise would be lost."

Dr. Skiff (*Field Museum of Natural History, Chicago*).—"Mr. President; I hope I have been mistaken in assuming from the remarks of the last speaker that he doubts the benefit to a mason or a metal worker or a carpenter of the impressions that Art in any form will make, not alone upon his product, but upon his future social life."

President French.—"Mr. Griffith is the director of the Art Museum of Detroit and he is naturally not at all prejudiced against Art."

Mr. Griffith.—"Not at all; we foster the art side, but here in Chicago Mr. Skiff has one museum and there is another at the Art Institute and there is an historical society and all these work along their different lines, but in Detroit there is only one museum, and where there is but one museum, it seems to me that it ought not to neglect the smaller things. Possibly I did not make myself plain, but that was the idea I had in mind."

Mr. Head (*Chicago Historical Society*).—"Mr. Chairman; I wish to give an illustration of the value of the suggestion made in regard to the small museums by one of the speakers. When I was a boy I studied at the Casenovia Institution at New York and the president was somewhat interested in geology. The country there abounded in what was known as 'Trenton limestone,' which was full of trilobites, and the president used to pick out perfect specimens of trilobites by the hundreds. He corresponded with various institutions all over the world, as well as institutions in this country, and exchanged these trilobites for other specimens and thus obtained a remarkably fine collection from all over the world.

"I simply wanted to mention this as an illustration of the value of the suggestion made by one of the preceding speakers. When I thought about those trilobites, it also reminded me of an instance which the younger people present may not appreciate. In the days of my youth there was a book called, 'Vestiges of the Natural History of Creation,' which was not exactly a scientific book. Among other things it attacked

the theory which was pretty universal at that time, that the world was only six thousand years old, and gave a great many illustrations combatting that theory. I remember that the clergyman where I attended church, at one time, found that that book had been read by some of his parishioners, and he proposed to simply demolish it. So he took up this question of the age of the world, and the argument in the book which was based upon the fact that these trilobites were found imbedded in the rock through that part of the state, and he said that it was simply a piece of blasphemy to claim that it had anything to do with the age of the world. He said it would be just as easy for God to make those rocks full of trilobites as it would be to make them without." (*Laughter.*)

Mr. Charles C. Adams (*University of Chicago*).—"It has been my fortune to examine a rather large number of small college museum collections and I can make the statement that they are, as a rule, pretty well covered with dust and in a chaotic condition generally. There are exceptions, of course, but I should say that that is the usual condition of the small museum. If you bear that in mind it seems to me that we can better understand the real situation. Many, of course, would prefer to follow the middle line, as Mr. Griffith has suggested, that is, to take care of some things as best you can, put your primary efforts there and then do what you can with the other things. That is a system which many of the institutions have been forced to follow. It seems to me that we should bear in mind the two extremes, that of having a good many things in good condition, or a large number of things largely in chaos."

DISCUSSION OF THE ADVISABILITY OF SEPARATE SESSIONS OF ART AND SCIENCE

Following a detailed explanation by President French of the scope and work of the Chicago Art Institute, a short discussion was had as to the advisability of holding separate sessions of the sections of art and natural history. The text of the discussion follows:

Mr. William Henry Fox (*John Herron Art Institute, Indianapolis*).—"Mr. President; it may seem to be a little late to speak of this matter, but it seems to me that my opinion has just taken shape sufficiently to give me the courage to speak of it When I came to this conference I was hopeful that we would have the art membership of the Association and the natural history membership so divided that we could hear the papers in a concentrated form. I speak now with a certain amount of personal feeling, because I am obliged to go away tonight, and may lose a good

deal. I came for the purpose of being instructed and if it is not too late now to make a change in the program, might we not take this matter up for consideration at the next session of the Association? It seems to me that in the course of time the mass of papers will become so bulky that it will undoubtedly take more time than we can possibly give. On the other hand, if the contribution of papers in each section is small, it enables us to attend the balance of the sessions of the other section.

"At all events, the objection made by some of the members, whose opinions I believe, Mr. President, were asked regarding this matter, seems to be met by simply referring to the very complete and beautiful record published last year. There are the proceedings complete; there are all the papers and the discussions, and it seems to me no members would lose any part of the proceedings if they could rely upon the journal published subsequent to the meeting. For that reason I hope that those who think about this as I do, will take up for serious consideration whether we should have divided meetings at the next convention."

President French.—"It seems to me a good time for the discussion of this question, which I understand to be that of establishing a chapter of art museums within the Association, which shall at times hold different sessions so that when the naturalists are discussing the proper method of preserving insects, for example, we might be considering something regarding the preservation of pictures."

Dr. W. P. Wilson (*Philadelphia Museums*).—"Mr. President; up to the present time we certainly have not had more papers presented than can be read during the two or three days that our meetings will continue and for this session at least I should be positively opposed to any separation. I would favor, however, having the art papers together in succession, if anyone so desires, and the other papers, which cover everything on the face of the globe, together; but personally, for the present, I wish to hear the art papers and the discussion which follows. I wish to hear of the educational work of all museums and to become acquainted with the personnel of the art museums, and I would be decidedly against a separation at this time, without committing myself for the future.

"Inasmuch as the gentleman from Indianapolis must leave, I would favor the reading of the art communications first, if that meets with the approval of the society."

Mr. F. J. V. Skiff (*Field Museum of Natural History, Chicago*).—"Mr. President; I presume that only by unanimous consent, or by some consent, can the report of the committee, seriously appointed for the purpose of arranging the program, be changed, and, anxious as we

always should be to accommodate fellow-members, since the majority intend, as I believe, to remain through the session, I doubt the advisability of setting the example of lightly turning aside the report of a committee definitely appointed for a definite purpose, and I therefore trust that the program committee's report will be carried out exactly as they have submitted it.

"On the general proposition, I should consider it quite unfortunate if the different classes of museums separated from the main body and selfishly discussed their own little affairs exclusively among themselves. I think we should stand together. I hope we shall never have separate meetings in this organization; for we each need the sympathy, the appreciation and the assistance of the other." (*Applause.*)

Mr. George Corliss (*Art Institute, Chicago*).—"Mr. President; I do not believe in the separation that has been proposed, but I think, inasmuch as there are members here who are interested especially in art museums, as well as those who are interested in natural history museums, that it would be well to sandwich in a little of the art discussion and paper reading with the natural history. Now, we have had nothing but natural history this morning and the program, as I understand it, will continue along that line. Would it not be a relief, then, to the natural history members to listen to a little art?

Mr. E. E. Blackman (*State Historical Society, Lincoln, Nebraska*).—"Let me suggest, if the program permit it, that at least an hour of the general sessions this week, or possibly longer, be devoted to a round-table to be conducted by those especially interested in art, another to be conducted by those especially interested in scientific museums, and still a another for those especially interested in historical societies and museums. I believe these three will cover the representation here.

"I am myself interested in historical museums, but I do not wish to miss the general papers and the discussions of the departments of art and science. Still, I am especially interested in historical societies, and therefore I suggest for the consideration of future committees on program that a round-table be established so that we may all separate and get acquainted with our brothers during the special meetings at the round-table, and during the general sessions of the Association we may become acquainted with our cousins, if you please."

Mr. Fox.—"I do not wish the Association to think that I am pleading my personal conveniences in urging this change As a matter of fact, I tried to make it clear that I only wanted it discussed for the purpose of our future guidance. It occurs to me to ask what we are going to do if

we have a great mass of papers accumulated in the future. Will we extend the sessions beyond the three days, to four or five or six days? There must be some limit to it. We must provide against that possibility, and as our Association grows, and the interest in this work increases, as I suppose it always will increase, we will probably have any amount of contributions upon any and all subjects, and I would like to have some way to satisfy myself or to satisfy the Association that we can handle the vast mass of material that we can get in the future."

Secretary Rea.—"I think one of the great advantages of our Association at present is its small size, and considering the rather small number of active museums of either art or science in this country, I am not at all sure that we are going to become a very large association for a great many years to come. I think there is a very strong feeling among the scientific men at least that the art people and the science people have much to learn from each other, and that the apparent difference between us is more imaginary than real. I therefore hope that these Association discussions may serve to bring us much nearer together, much nearer a common ground, than we sometimes imagine ourselves to be.

"If we do become too large for the reading of all the papers in the time allotted, it is possible that we might adopt a plan which I know to be in use in a large association of something like eight hundred members. In that case the papers are printed in advance and sent to the members and read and carefully digested before the meeting. When the meeting arrives, the whole time is given to discussion. I do not know whether we shall ever come to that or not, but it seems to me an interesting suggestion."

Mr. Henry L. Ward (*Milwaukee Public Museum*).—"Speaking for the committee, I can say that we are not embarrassed by having too many papers to fill the time. It seems to me that the papers will not overrun the time at all, and the papers which were distinctly on art were very few in number. I do not think that it would be good policy to tie the Association or future committees to an assignment of papers where they might not be desirable, but if at any time it becomes necessary to make some such provision, in order not to carry the meeting to an undue number of days, the future committees can, in my judgment, make that selection when the time comes."

Mr. Charles M. Kurtz (*Buffalo Academy of Fine Arts*).—"It seems to me that if the scientific, historical, archæological and art papers are considered in groups by themselves, then all who are able and who desire to attend all the sessions can have the privilege of listening to all the papers,

while those who cannot give the time for the whole meeting can attend the particular session or sessions which pertain to their own institutions. This, however, is only a suggestion for the future."

President French.—"I think it must be very gratifying to all of the art institutes to see this opposition to separate sessions. It is certainly very pleasing to me and a little unexpected that the scientific gentlemen should desire to listen to our art papers. We have been listening with great interest to their scientific discussions, so that I hope the feeling is mutual.

"Of course, there is no question before us; we are in a committee of the whole, as it were, and we have no intention of taking a vote, but we can perhaps proceed, as I have heard that they do in Quaker meetings, where they discuss the subject freely and take no vote, but the presiding officer announces the sense of the meeting. Personally I am very much pleased; I thought you would all jump at the chance of having separate sessions."

Dr. Wilson.—"Mr. President; I hope that the papers will be so sandwiched in that no one can get away. Here is a paper on fumigation announced. What an ugly topic that is, and how under the sun can it be related in any way to art? Why, consider all the fine textiles and the ancient textiles, and the handsome carvings of woodwork that are likely to be eaten up by certain kinds of insects that are coming in from foreign countries! I think this would be one of the most interesting topics of all for the art side. Therefore, I say that I hope everything will be so arranged that nobody can get out of the room for fifteen minutes without losing much that is of interest."

The hour of adjournment having arrived, on motion of Mr. Corliss of the Art Institute of Chicago, a recess was taken until 2:30 o'clock p.m.

SESSION OF TUESDAY, MAY 5

Afternoon

The afternoon session was called to order by President French at 2:30 o'clock, and, following the regular program, a discussion of the advisability of publishing a directory of museums was taken up.

DISCUSSION OF THE ADVISABILITY OF PUBLISHING A DIRECTORY OF MUSEUMS

Secretary Rea opened the discussion by emphasizing the value to museum administrative officers of conveniently accessible information

which will enable them to compare the relative efficiency of various museums. After showing the inadequacy, in many cases, of annual reports and of the list of museums of the United States and Canada published by F. J. H. Merrill[1] in 1903, the following items for incorporation in a museum directory were suggested.

1. *Name* and *location.*
2. *Population and assessed valuation of city or town.* This information is desirable in the case of public museums as an indication of the relative support given to museums in various communities.
3. *Staff.* This item should include the names and titles of all officers, together with a classified enumeration of the number of minor employees, e. g.—guards, janitors, engineers, etc.
4. *Nature and Scope of the Collections.* The extent of museum collections can be fairly expressed only by somewhat detailed enumeration. Thus 10,000 zoölogical specimens representing fairly evenly the chief zoölogical groups means something very different from 10,000 insects or shells. The following classification of biological and geological collections is offered as a purely tentative suggestion. It is intended that the number of specimens in each department should be given with the ± sign when based on estimate only. *Underscoring* departments most active at the present time will further increase the value of the work. Similar classifications will be required for other departments, *e.g.*, art, history, anthropology, etc.

   Zoölogy.
   Shells, on exhibition, in storage.
   Insects, on exhibition, in storage.
   Other invertebrates, on exhibition, in storage.
   Fishes, on exhibition, in storage.
   Reptiles, on exhibition, in storage.
   Birds, on exhibition, in storage.
   Mammals, on exhibition, in storage.
   Other collections, economic, etc.
   Types, figured specimens, or other material of special interest.

[1] Merrill, F. J. H., Natural History Museums of the United States and Canada, N. Y. State Mus., Bull. 62, Albany, 1903.

Botany.
Cryptogamic herbaria.
Phanerogamic herbaria.
Other collections, economic, etc.
Types, figured specimens, or other material of special interest.

Geology.
Minerals, on exhibition, in storage.
Rocks, on exhibition, in storage.
Other collections, economic, etc.
Material of special interest.

Paleontology.
Invertebrates, on exhibition, in storage,
Vertebrates, on exhibition, in storage.
Plants, on exhibition, in storage.
Types, figured specimens, or other material of special interest.

5. *History.* A brief historical sketch frequently serves better than statistics to indicate the traditions and tendencies of a museum.

6. *Financial Support.* The following points seem essential to determine the relation of the museum to its constituency:

I. Income from:
(a) Endowment. (b) City, state or nation. (c) School, college or university. (d) Society or association. (e) Subscriptions, memberships, etc. (f) Admission fees. (g) Other sources.

II. Building, cost, paid for by, owned by, maintained by.

7. *Relative stress* laid on:
(a) Exploration. (b) Research by staff. (c) Teaching in school or college. (d) Public school work—indicate methods used. (e) Instruction of general public. (f) Local collections. (g) Other activities.

8. *Library.*
(a) Extent. (b) General character. (c) Whether intended for use of staff or public, or both.

9. *Publications.* List, with scope of each series.

10. *Attendance.*
(a) Conditions and restrictions. (b) Statistics.

11. *References* for further administrative information.

Mr. Frederick A. Lucas (Brooklyn Institute Museums).—"Mr. President; I think that every one will agree that such a publication would be of great value. Our English friends have issued just such a directory, but in rather poor shape. It gives the very data that Mr. Rea has mentioned, in regard to the museums of Great Britain, covering exactly the same ground. In talking it over with Mr. Rea, however, the cost of publication seems to me to be the great drawback, unless it can be financed by the Carnegie Institution."

At the request of President French, Vice-President Lucas here took the chair.

Chairman Lucas.—"I should be glad to have a discussion of the desirability of this project and to have any suggestions offered as to the method by which it may be published."

Mr. Henry L. Ward (Milwaukee Public Museum).—"I can appreciate Mr. Rea's point of view. I usually look over the annual reports of museums that come to me, with very much the same thought in mind, apparently, as Mr. Rea has; that is, to make a comparison of the efficiency of our work with that of other institutions, so as to see how we are comparing with them and to get ideas that may be of value. I have used the Directory of Museums, published by the New York State Museum, somewhat, and have been impressed with the practical impossibility of determining the value of any collection by the statistics that may appear in such a directory. A museum that really has very little of value may appear in such a directory as of equal or greater value than some museum that has a very decided value. There can be no comparison between such museums based solely on an enumeration of the number of specimens in the different departments. The specimens may be entirely without scientific value, altogether inferior, things that a good museum would throw away, or each may be as choice as can possibly be obtained. I have often been very much disappointed in looking at a museum that made a very good showing in the directory that has been published.

"There are certain features of museum information that can at present be obtained from Minerva which perhaps do not appear in any other publication. You can find out just what any other museum is getting, practically, in the way of an appropriation, you can find out in bulk the contents of the museum, and what its purposes are, but it does not give very much.

"I do not really know whether the information sought for by Mr. Rea is worth what it would cost. It is something that interests only certain

ones and whether it really pays for the great amount of labor involved and the considerable cost of bringing the information of all the museums of the country together is rather doubtful. It seems to me that the same amount of money and energy applied in some other direction might be of more permanent value."

Dr. W. P. Wilson (*Philadelphia Museums*).—"I believe the time is coming when we shall establish several institutions or departments which will aid in the systematic management of museums. One institution or department will develop a system of exchanges of material and do that in some thoroughly scientific way so that institutions which have surplus material will distribute it among other institutions large or small, which have not that kind of material, but need it for educational or other work. I believe that we shall come to a point by and by when we shall establish exchanges between museums employing experts. Some of us will be able to bring over from Europe, possibly, great experts who will spend, in accordance with previous arrangements, a month in one museum, doing certain lines of work, and a month in another museum and two months in another, and be glad to do that in order to study the special kinds of material in which each particular expert is interested.

"That sort of organization between museums, I believe, has not begun yet, and I regard this publication which Mr. Rea has proposed as a compendium of the information on which much of that work is to be based. I regard it, no matter what it costs, as very valuable and something that should be done.

"I believe that if we as museum curators and managers, deeply interested in museums, set our minds to do that sort of thing, it will not be very difficult to get it done. I believe that if a committee were appointed from this organization, composed of the various managers and curators and directors, and that committee should go to the Carnegie foundation, it would be a very strong representation. I think we could get the money to publish such a useful book, if it were shown of what assistance it might be in future educational work and in coöperation of the museums in this country and I support very strongly the idea of starting out and, in one way or another, working to fulfill the end which has been proposed by Mr. Rea."

Mr. E. E. Blackman (*State Historical Society, Lincoln, Nebraska*).—"When the manuscript was prepared, we would then doubtless be able to find publishers. I think if this Association were to appoint a committee to take up this matter and prepare the manuscript for such a book, there

would be no great difficulty in finding publishers, and I would suggest that a movement be made along this line at this meeting."

Dr. Wilson.—"I am going to propose two things: in the first place, to make the proposer of this scheme, Mr. Rea, a member of a committee, and I would say the chairman, to collate this material; in the second place, that every person connected with any museum carefully work up the material of his own museum and send it to Mr. Rea. He is a young and energetic man, and I am sure that in this scheme in which he is intensely interested, that he would work late into the night to see it accomplished, and I therefore make these suggestions as a motion if anybody else will support it."

Chairman Lucas —"Is there a second to the motion?"

Mr. Blackman.—"I will second it most heartily."

Dr. Wilson.—"I desire to make the further suggestion that Mr. Rea print an outline of what he wants, and if any of us can add anything to it, before he prints it, that we do so, and that the outline be printed and sent to all of us. In other words, if we have anything to add, or anything which we think should be in such a book, we will have an opportunity of suggesting it.

"But the first thing is to get an outline. Mr. Rea has been studying this matter and I suggest that this outline be prepared by him and given to all of us, and if we can add anything to it to do so and send it in to him."

Mr. Blackman.—"And that the bill be paid by this organization for the printing."

Dr. Wilson.—"That so far as the expense of starting this work and printing this outline is concerned, that this be paid by the Association. It would be a matter of only a few dollars. I do not suggest that Mr. Rea be paid for his work; I know that he does not wish to be paid for his work because it is something that he loves to do and something that he will be glad to do, but I suggest that the printing and the typewriting and everything of that kind be paid by the Association, if Mr. Rea will undertake the work."

Chairman Lucas.—"It is moved and seconded that Mr. Rea prepare a circular outlining the information he desires this directory to contain, and that this be sent to each member of the Association to be filled in and returned to him. Do I state that correctly, Dr. Wilson?"

Dr. Wilson.—"I would like to add that it be sent not only to the members of this association, but to every museum, large or small, that can be found in the United States, or on the North American or South American

continents. Let us make it as broad as this organization is meant to be. We now include museums in South America, and let us have every museum on the Western Continent in it.

"The getting together of this material in systematic form will be a very strong argument to induce the Carnegie Foundation to publish it."

The question was then called for, and the motion being put to a vote, prevailed unanimously.

President French here resumed the chair, and reverting to the regular program, called for the submission of papers. The following paper was presented by Mr. C. G. Rathmann, director of the Educational Museum, St. Louis.

THE EDUCATIONAL MUSEUM OF THE PUBLIC SCHOOLS OF ST. LOUIS

The museums of our country have in late years extended the scope of their work of disseminating knowledge to a field where it is of inestimable value. They have opened their great store houses of information to the public schools and they ask the teachers to make extensive use of the wonderful things from all parts of the world in connection with their regular school work. Some of the museums send typical collections of illustrative material directly to the schools. Others invite the teachers to bring their classes to the institution, and give their lessons there, aided by the wealth of interesting specimens placed at their command; still others do both. In this manner the museums enable the teachers of our schools to supplement the textbook and their own description of facts and conditions by the study of real things and thereby to lend life and reality to their work. This practical coöperation of the museums with the schools is hailed by the teachers as one of the most helpful factors in enlivening the study of nature and geography, in stimulating the interest and self-activity of the children, and in making school work more enjoyable to both pupils and teachers.

St. Louis has no public museum. The Washington and St. Louis Universities, the Academy of Sciences, and the Historical Society have their own excellent museums, but these cannot aid the schools in their work.

In 1904 our city had within her walls a most magnificent Public Museum, the World's Fair. The exposition gave St. Louis the opportunity to extend to her schools the same educational advantages that

museums, in such an efficient manner, give to the schools of other cities. Through gift and purchase, the Board of Education acquired large amounts of material of the highest educational value and this material formed the nucleus of a new institution, the Educational Museum of St. Louis.

When the first attempt at a logical arrangement of the articles acquired from the World's Fair was made, it was found that much new material was needed to fill the gaps and to supply the missing links in the chain of groups and collections which were to illustrate the various features of school work. We applied to some of the large museums that are represented here today to help us and they responded most readily and generously. Large amounts of valuable material were donated by our host, the Chicago Field Museum, the Philadelphia Museums, the Smithsonian Institution and the Public Museum of Milwaukee. I am happy to have this opportunity given me to express to the directors of these institutions the sincere gratitude of the Board of Education and the teachers and pupils of the public schools of St. Louis for their liberal and efficient aid.

The Educational Museum was opened in October, 1905. It is at present located in rooms of the Teachers College and the Wyman School. Its growth during the brief period of its existence has been remarkable. From the very beginning, the teachers, realizing the great value of proper illustrative material, made extensive use of the Museum. To satisfy the constantly growing demand upon the institution, the Board of Education made a liberal annual appropriation for the purchase of new material and the general maintenance of the Museum. The present temporary quarters are becoming inadequate both as to space and proper means of arrangement, and the erection of a separate building in the near future is becoming a necessity.

The material in our Museum is grouped and arranged in accordance with the Course of Study followed in the schools Some of the groups which illustrate lessons in Nature Study, Geography, History, Reading, and Art, are the following:

Food Products,—comprising the cereals other plants, grains and their products; coffee, tea, sugar, cacao, cocoanut and the various spices, etc.

Materials for Clothing,—the various animal and vegetable fibres of the world and the fabrics made from them.

Other Natural Products,—as rubber, gutta-percha, camphor, cork, coal, etc., their various stages of development, and their use; material for dyeing and tanning, medicinal plants, woods, etc.

Industrial Products,—showing the various processes in the manufacture of glass, paper, leather, ink, the pen, pencil, needle, etc., besides such products as are made from the materials mentioned in the former groups.

Articles and Models Illustrating the Life and Occupations of the Different Peoples of the World, including implements, wearing apparel, models of houses, industrial products, etc.

Plants, and Models and Charts of Plants.

The Animal World, represented by mounted and dried specimens and specimens in alcohol.

Minerals, Rocks and Ores.

Apparatus for the Illustration of Physics and Physical Geography.

Charts, Colored Pictures, Maps and Objects Illustrating History.

Collections of Art Objects, and Models Used by the Classes in Drawing.

Photographs, Stereoscopic Pictures and Lantern Slides, to accompany the objects in the preceding groups.

These groups are subdivided into smaller sections, or collections of from 4 to 8 objects, each of which represents a class or family of the group, as for instance, in the case of birds, collections of wading birds, of owls, of finches, etc. Each collection is accompanied by a number of photographs, stereoscopic pictures and lantern slides.

These collections are numbered and listed in the Museum Catalogue to which, because of the rapidly growing material, two supplements have been added. With each article mentioned in the Catalogue, a brief explanation is given, as to its use, where it is found, etc. At the head of each group, a number of reference books are mentioned which are found in the Museum Library and which give information about all the specimens in the group. Copies of the catalogues are found on the desk of every teacher in the schools.

The material is sent to the schools by a wagon in the service of the Museum. The schools are divided into five sections, each of which has a delivery day once a week. The principal of a school which has its delivery day on Monday, asks his teachers on the preceding Friday to send him the numbers of all the collections which they need for the illustration of their lessons during the following week. These numbers he inserts in an order blank and sends the order to the Curator, and on the following Monday the wagon delivers the material at the school, taking back at the same time the collections used during the past week.

A brief outline of a geography lesson introducing the children to the

study of a new country, may be sufficient to show how the museum collections are put to use in the school room.

On a relief map the children determine the location, study carefully the surface features, note the proximity to or the distance from the ocean, and find the prevailing winds and their directions. After having become thoroughly acquainted with these fundamental features, the child is led to find by his own observation and reasoning and by his experience gathered in former lessons, what climate and rainfall there may be, what animal and vegetable life may be expected, what portions of the country may be best adapted to agriculture, herding, mining, lumbering, and the various other occupations of men; how the physical conditions affect the development of the country, the life of its inhabitants, its resources, its commerce, its rank and importance among the countries of the world and its relations to and influence upon these countries and especially upon our own country. They find where larger cities would be likely to be located and what articles might be exported from these places and they determine lines of transportation and communication.

Now, the conclusions that the children, under the guidance of their teacher, have made through their own observation and reasoning in studying the map, are verified by the material sent by the Museum. We take the children directly into the country by means of the photograph, the stereoscope and the lantern. We make them see the surface features, as they really are, the mountains in true proportion, the river valleys, the scenery, the natural advantages of the country, the large cities and their institutions, the people, their occupations, their homes, their manner of life, and their state of civilization.

The knowledge of the physical conditions has enabled the pupils to determine to some extent the flora and fauna, the natural and industrial products. We now place before them the typical animals, birds, insects, etc., and the raw and manufactured products, in all their various stages of development.

This illustrative material is not simply shown the children as new and extraordinary things to satisfy their curiosity. The objects are handled, observed and studied by the children, compared with each other and with such as have been treated in connection with other countries. The children determine how the products before them affect the life of the people, their intercourse with other nations, their wealth and rank, also how they decide lines of transportation, ocean trade, etc. Each child in the class takes up one of these objects and by his own reading gathers all the information he can regarding it and presents such information to the class.

By means of the photograph, the lantern slide and especially the life-like stereoscopic pictures, we take the children into the world; by means of the objects, we bring the world to them.

The intelligent study of the relief map gives the pupils the power to read the map of any country as they would read an interesting book and the power to acquire their own geographical knowledge after they have left school The study of the museum material shows them that their conclusions drawn from the map study are true; it gives them vivid and lasting impressions of the country, and the power to picture to themselves things, facts and conditions for which we have no means of illustration.

In nature study we insist that living specimens be used for illustration, whenever they can be procured. The surroundings of every city afford unlimited means of illustrating plant and insect life, which should be gathered by the children themselves. The very collecting of this material is a practical nature lesson in itself for, while the children are gathering the specimens, their minds are busy with what they know about them and what they would like to know.

Live birds, fishes, reptiles, amphibia and mammals, however, with few exceptions, cannot be procured or cannot be handled in the school room. Yet they live with and around us. We wish to make the children acquainted with them and the Museum therefore supplies them.

How few of the graduates of the Grammar Schools in many cities know the birds that they see in the gardens and parks. To make the acquaintance of the birds, our children study the mounted specimens of the Museum. Then we encourage them to find outdoors the living birds not for the purpose of recognizing them only, but to observe them in their proper surroundings, to learn their peculiarities, their habits of life their food, their song, their means of protection, etc.

The material of the Museum is in great demand; the use of it increases from year to year. During the first year, 5000 collections were sent to the schools, during the second, 11,500; and during the first half of the present term, more than 10,000 collections were ordered by the schools. A second wagon will be put into service at the beginning of the next term.

The number of different individual collections sent out by the Museum is 1000. Many schools order the same material at the same time; hence, a large number of duplicate collections are necessary. These duplicate collections amount, at present, to 3200.

This is a brief sketch of our traveling museum, our museum on wheels. But while the circulating material constitutes the most important part of

our museum, the institution contains other features which are of signal value to our educational system. These are:

The Study Exhibits for Teachers.

The Exhibit of Educational Material from Foreign Countries.

The Exhibit of our Own School Work.

The Teachers Library.

An exhibit of collections in circulation is placed in glass cases in the large museum hall of the Wyman School. This is the study exhibit for the teachers which enables them to become thoroughly acquainted with all that the Museum contains and gives them an opportunity to acquire, with the help of the Museum Library, such information as they need in order to use the material intelligently and profitably. No Normal School or Teachers' College can give their students the general information in all departments of science which a modern teacher must possess to go far beyond the text of the book and make the work interesting and valuable. A museum arranged in accordance with the course of study and supplied with a good reference library, can do this. Our teachers make good use of these exhibits, and many of them tell me how the study and use of the material has widened their horizon, how much better prepared they feel for the subjects they are to teach and how much more pleasure and satisfaction they find in their work.

Another department contains educational exhibits from other countries. These exhibits representing the schools of some of the leading countries of the world show the written work, work in drawing, manual training, etc., from the kindergarten to the high and normal schools; text books, courses of study, reports and statistics and school appliances; photographs, plans, and models of school buildings, etc. These exhibits give our teachers valuable opportunities to study the educational systems of other lands.

The exhibit of the work of the St. Louis Public Schools which was displayed at our World's Fair and at the Jamestown Exposition, constitutes the fourth department. The specimens of the children's work in the various branches of study will be replaced by new work from time to time in order to show visitors the status of the work in the schools at the time of their visit.

The Teachers' Library forms the fifth department of the Educational Museum. It contains the best publications on Philosophy, Psychology, Education, Science and Literature, the text books used in our own and other countries, reference books giving information on all the material in the Museum, and the best educational journals. The number of

volumes is at present about 7000, 2000 volumes of the valuable private library of Dr. Soldan, our late Superintendent of Schools, have just been presented by his widow to our Teachers' Library. A catalogue of the library is in the hands of each teacher. She may procure the books in two ways, either by calling at the library to select the books she wishes to read or by inserting the title of the volume or volumes in an order blank. The books desired are sent to her school in the same manner as the museum material. You see we make it very easy for our teachers to avail themselves of the opportunities offered by the library and I am glad to say that it is extensively used.

I sincerely hope that some time in the near future this Association will honor St. Louis by having one of its conventions within her walls and by giving us the opportunity to make you better acquainted with our Educational Museum.

Mr. George L. Collie (*Logan Museum, Beloit College*).—"I would like to ask Mr. Rathmann the effect of the traveling museum upon the pupils in the St. Louis schools. What is their attitude toward the geography of today as compared with that of four or five years ago?"

Mr. Rathmann.—"There is a great improvement. Formerly the teacher took the pupils on imaginary trips to the rice and sugar plantations of the South and to the silvas of the tropical regions, but the rice plant and sugar-cane and their products in all their different stages of development, the birds and insects of the tropical forests, the crude rubber, the cacao pod, the fruit of the coffee trees—these the children never saw. The teachers talked to the pupils about the wonders of the world, and the more and the better they talked about them the greater became the anxiety of the children to get into personal touch with all these wonderful things. Now we bring the world to them, and with this material before them we have their attention, their interest, and their desire to learn.

"I should very much like to have some of you go into one of our school rooms and see how attentive the children are, how eager they are to give their own impressions, how glad they are to find their own information about these things, and you would see at once how valuable it is. I have often noticed that some pupils whom I had under my own direction when I was principal of a school, did not take any interest in geography, but now these same pupils are eager to study geography under the new methods and find great pleasure in it."

Mr. L. L. Dyche (*State University, Lawrence, Kansas*).—"I would like to ask what the effect is upon the specimens in this moving museum."

Mr. Rathmann.—"When we sent out the first specimens we were afraid they would last only a short time, but I am glad to say that the teachers realize that some of these specimens are very hard to replace. They see the value of them and wish to keep them for their schools, and so far the specimens have been preserved very well. Of course specimens which are used a great deal must be replaced from time to time."

Mr. Dyche.—"I asked that question from a little experience of my own with a thousand birds which I loaned, from time to time, and I think I can safely say that seven hundred have lost their heads and half have lost their tails. But, while it costs more or less to make up these bird skins and they do not last very long, I think the results achieved are sufficient to warrant this additional expense."

Mr. Rathmann.—"That was our experience during the first year, but now we fasten these birds to the bottom of the circulation boxes, and the damage that might be done in transportation is in this way avoided. The teachers, after they have used the birds, send them to the principal's office, and the man in charge of the wagon, who is very careful, puts them back in their places. The teachers are not allowed to do this. Of course, during the three years that this work has been going on, we have made many improvements in the handling and preparation of our material, which we did not know during the first year."

Dr. W. P. Wilson (*Philadelphia Museums*).—"How many grammar schools have you in the city of St. Louis?"

Mr. Rathmann.—"One hundred and three."

Dr. Wilson.—"Are they all pursuing the same course of study?"

Mr. Rathmann.—"Yes, sir."

Dr. Wilson.—"Do you have, then, 103 collections, in a particular line, we will say, of grain or of cotton, or of birds, in case they should all happen to ask for them at the same time?"

Mr. Rathmann.—"Of the grains and other material which is in constant use, we have a very large number of collections enough to supply all the schools. But it never happens that all the schools use the same material at the same time. For instance, we have twenty-two different specimens of owls. These we divide into collections, and these collections do not consist of the same kinds of owls, because it is not necessary in the grammar schools that we should make such scientific distinctions."

Dr. Wilson.—"Certainly not. I want to get at the practical difficul-

ties, some of which I have discovered. If you are studying the question of cotton, for instance, what would you include in that collection?"

Mr. Rathmann.—"Our cotton collection contains the boll, the ginned and unginned cotton, the various cotton fabrics, miniature bales showing how the cotton is packed and shipped, cotton seeds, cotton-seed oil cake, cottolene, soap, paper made of cotton stalks, and then a series of pictures arranged in accord with these objects. By means of the objects and the pictures the child is first taken to the cotton field, then to the cotton gin, then to the levee at New Orleans to see how the cotton is baled and shipped, then to the large factories of the east, then to the cotton mills, and so on.

"In order to show that the American Upland cotton is not the only cotton, we have the Sea Island cotton, the Peruvian cotton, the silk or bombax cotton, and the cotton pods of the Philippines, etc. Furthermore, we have the crude and primitive implements which the people in the Philippines use in cultivating and manufacturing cotton, and by comparing these with the great factories in the east we give the child an idea of the wonderful progress of civilization."

Dr. Wilson.—"If a grammar school should send to you for a study in cotton, would you send them all that material?"

Mr. Rathmann.—"The cotton exhibits are divided into seven collections. The first comprises cotton bolls, unginned and ginned cotton, seeds, miniature cotton bales, etc. The second collection contains other cottons, as Sea Island, Peruvian, etc.; the third and fourth show the various stages in the manufacture of cotton fabrics; the fifth, the products of the cotton seeds; he sixth implements for the cultivation and manufacture of cotton used in the Philippine Islands and other countries; the seventh, stereoscopic pictures, photographs and lantern slides. These are all mentioned in the catalogue, and the teacher may select what she needs for her special lesson.

Secretary Rea.—"May I ask, Mr. Rathmann, if you send out with this material any instructions to the teacher or must she come to the library in order to get information?"

Mr. Rathmann.—"The catalogues contain instructions for using material. Besides this, supervisors and strong teachers present work illustrated by museum material with classes taken from the various schools. These classes show their work on Saturday mornings at the Teachers' College and in the meetings of the Society of Pedagogy."

Secretary Rea.—"When this material illustrates the consecutive steps in any process, do you consider it essential that the material should go to the students in logical order?"

Mr. Rathmann.—"As far as possible, yes."

Secretary Rea.—"How do you obtain that result without having a large part of the class in idleness while waiting for the specimens?"

Mr. Rathmann.—"We have the two-class system in our schools. One class has an oral recitation while the other prepares for the next lesson. While one class recites, the other, we will say, studies the lesson in geography which it is going to recite during the next half-hour. The latter is given the objects and stereoscopic pictures to study. We send the pictures and twenty stereoscopes, enough to supply each child with one, so as to make it possible for the children to change the pictures and go right on. The teacher has studied the objects and pictures carefully, has taken notes of all the different points she wishes to bring out, and directs the attention of the children to these points before she lets them take up the material. Then when they are ready to recite they give their observations and impressions."

Secretary Rea.—"Does this plan begin with the first pupil in the front row and go consecutively through the portion of a class which is to study that material?"

Mr. Rathmann.—"Generally; we like to do that as much as we can."

Secretary Rea.—"And the sections that are using this material would not comprise more than fifteen students?"

Mr. Rathmann.—"From twenty to twenty-five."

Secretary Rea.—"Does the last pupil get the first specimen before the end of an ordinary period?"

Mr. Rathmann.—"The study period is thirty minutes, and they have ample time to see all the material."

Secretary Rea.—"Then the first specimen goes the round of the twenty pupils?"

Mr. Rathmann.—"Yes, we see that every child is reached. I must say, however, that for some things we have not the amount of material yet that we wish to have."

Secretary Rea.—"I am speaking particularly of consecutive specimens showing the consecutive steps in a process."

Mr. Rathmann.—"Yes. We consider it important that in exhibits which show processes of development, as cotton, flax, silk, rubber, glass, leather, etc., each child should see every link in the chain of development."

Secretary Rea.—"In that case it would go to the first student in the front row and the specimens would be passed along until the last pupil in the last row had received the first specimen, in other words, until the series had been shown to the whole class?"

Mr. Rathmann.—' Yes."

Secretary Rea.—"I ask these questions because I have had great difficulty in handling exhibits showing the consecutive steps in any process, and reaching the whole class quickly. For instance, I have been using an iron and steel exhibit and I have to divide the exhibit into the forms of iron ore, its distribution, its transportation, and the smelting and manufacture of iron. The latter is again divided into several different processes in order to obtain half a dozen different groups of specimens and start one group in one row and the next group in the next row, in order to reach all the class, so I am very much interested in this part of the discussion."

Mr. Rathmann.—"That is the end we are trying to reach, but we have not yet attained it. We would like to have for each class of twenty pupils at least five or six different exhibits."

Secretary Rea.—"I would like to ask if you have any definite means of learning just what advantage the pupils receive from these exhibits. Do you get any returns upon their work?"

Mr. Rathmann.—"Oh, yes, the supervisors report to the superintendent and to the director of the museum. We have four assistant superintendents and three primary supervisors. They visit all the schools and observe the results of using illustrative material in connection with the lessons and they are unanimous in declaring that the interest in the branches I have named has increased greatly since this material has been in use."

Secretary Rea.—"I have tried and am trying now in experimental form, the plan of providing for the exhibit a blank form containing interrogations as to the exhibits. The answers to these form the basis for an essay on the exhibit."

Dr. Wilson.—"I understand, Mr. Rathmann, that you use about twenty stereoscopes?"

Mr. Rathmann.—"Twenty instruments and different numbers of pictures illustrating a subject. We do not send more than two or three copies of the same picture, in some cases only one, but we send twenty instruments so that each child has one."

Dr. Wilson.—"The whole class at the same time?"

Mr. Rathmann.—"Yes."

Dr. Wilson.—"And your classes number only twenty to twenty-five?"

Mr. Rathmann.—"Yes."

Dr. Wilson.—"Some of our eastward cities have classes that number forty."

Mr. Rathmann.—"We have in some rooms fifty pupils and more, but, as I remarked before, each room is divided into two classes, and only one class uses the material at a time."

Miss Alicia M. Zierden (Pennsylvania State Museum, Harrisburg).—"I would like to ask you if you have your courses marked out so that the first grade will take cotton, the second grade will take something else and so on through the grades?"

Mr. Rathmann.—"The courses of nature study and geography prescribe that."

Miss Zierden.—"Your eighth grade, then, does not have cotton?"

Mr. Rathmann.—"No, it does not."

Mr. Charles R. Toothaker (Philadelphia Museums).—"I am extremely interested in this work because we are doing a great deal of it ourselves, and I would like to answer a question that was asked a few moments ago in regard to the durability of specimens. We find that such plants as cotton and rice need a great deal of protection, otherwise they will soon be destroyed, and those of you who have noticed the celluloid covers that we put over them in our exhibit will probably be interested in them.

"There is another thing which I think is of a little interest. I have talked to a great many school teachers in Philadelphia and asked them about their methods of teaching, and this past winter we had a little experience which we have not had before. When I was talking about cotton to a class of 150 I found that small specimens were of comparatively little value, and I now have more sympathy with some of the teachers who have asked me for things in bulk than I had before. I also found that in dealing with a big class, I could do very little good in passing around a bottle of cotton seed for instance, but that if I put the same kind of cotton seeds in a tray covered with celluloid, that this could be passed around much more quickly, and could be inspected and handled much more rapidly and with no danger, and I am inclined to prepare specimens in that way, specially for dealing with large classes. In small classes you can pass around these specimens, but you cannot do so in a larger class with satisfaction, unless they are protected in this way. This is my own experience as well as what the public school teachers of Philadelphia tell me."

Mr. Rathmann.—"The teachers of St. Louis have the same idea, Mr. Toothaker."

Mr. Ira B. Meyers (School of Education Museum, University of Chicago).—"I would like to ask if, where this material is used during the

class recitation, there is any provision made for the material going on exhibition for a day or two or even a week in that room, where it can be examined by the children during the recess hours or after school, or if it is confined solely to the recitation period?"

Mr. Rathmann.—"The material remains in the school for a whole week and very often the principal has it in his office on display the last day. The children are offered ample opportunity to see and study the specimens outside of the recitation hours, but, of course, the chief purpose of this material is to illustrate the every-day class work."

Mr. Meyers.—"The reason I raised the question was that I have found from a limited experience of my own that while the children got a great deal out of the material in the class recitation, it was so fragmentary in its nature that it was unsatisfactory. It seems to me for that reason, that if the specimens could be arranged where the children could go in groups or individually and look it over at some other time, it would furnish them an opportunity to crystallize their information in a way that would not be possible in the class recitation."

Mr. Rathmann.—"I neglected to mention something which will answer your question: The teachers of the schools, two or three times a year, and sometimes oftener, take their classes to the large museum hall where the teachers' exhibits are gathered, and there the children get an opportunity to examine all these exhibits. During the three years that the Museum has been in existence, I think that more than half of all the classes in the schools have seen these exhibits."

Miss Anna Billings Gallup (*The Children's Museum, Brooklyn Institute of Arts and Sciences*).—"I am interested in another suggestion in Mr. Rathmann's paper, where he speaks of lending apparatus for illustrating physical science. I would like to know a little more about that, what the character of the apparatus is and to what extent and how it is used."

Mr. Rathmann.—"We have instruction in physics in the seventh and eighth grades of our schools, and for the illustration of this we have material, such as the lever, wheel and axle, inclined plane, magnet, dry batteries, sonometer, air pumps, force pumps, etc. In this instruction in the seventh and eighth grades we simply wish to make the children acquainted with some of the great laws of nature and to create in them a desire to make themselves acquainted with a great many of them. In order to reach this, we place before them this simple apparatus and the children perform their own experiments under the guidance of the teacher and, just as they do on the relief map in geography, they draw their own

conclusions and find their own truths. No lesson is given in physics unless it be illustrated by such material, because to talk to the children without it is simply a study of words, not of nature."

Miss Gallup.—"You send such material to them?"

Mr. Rathmann—"Yes, just as we do the other material."

Miss Gallup.—"Leyden jars and so on?"

Mr. Rathmann.—"Yes, we have 3 sets of 83 different collections in our physical museum which go from school to school just as the other material does.

'I want to add to my few remarks, and in answer to the many questions that have been asked, that the material which we have is by no means sufficient yet to fulfill all the demands, nor to make the teaching with it as efficient as we wish to make it, but during the three years we have made a good beginning and we shall not rest. We shall keep this up until we have our museum so well filled and so well arranged that every teacher can get as much cotton and as much of the other things as she needs to make her lessons enjoyable, interesting and intelligible."

Dr. Wilson.—"I would like to say that in the very last word of Mr. Rathmann we have drawn out one of the most interesting items of information which he did not intend to give us at all, viz., the circulation of physical apparatus in schools. I was not aware that that was done in any school in the United States.

"I also want to mention something we are doing in Philadelphia which I believe might be done in every state where there is a museum. We have not stopped with what the museum could do alone, but we have gone to the State Legislature in Pennsylvania and asked and obtained an appropriation, of $25,000 every two years, for the last six years, for the purpose of circulating collections. We have made these up very carefully and tried to get an epitome of representations which would illustrate the commerce and geography of the world. We have been circulating these for six years among the high schools of Pennsylvania at the expense of the state, and have already sent out over twelve hundred collections.

"The collections consist of different sorts of things to illustrate commerce. Our series representing cotton, for example, is made up of about a dozen 8 × 10 in. photographs, giving complete information as to the raising, picking, ginning, baling, and shipping, and full data as to cotton the world over is put on the backs of these pictures so that the teacher has it all in her hand. There are about fifty or sixty series, accompanied by a book very carefully compiled by Mr. Toothaker, and

as I say, we have sent them into twelve hundred high schools in the state of Pennsylvania. This last year we did not send these collections out until each school had prepared cases for them. We had them sent to the schools through the state senators and representatives, because that was the only way in which we could get the money, and we had the schools apply in that way so as to show the senators and representatives of the state that they were interested in these things. We sent out a few at first and they liked them and clamored for others. That made it simple to get the appropriation, because the senators and representatives were giving something away which the teachers and the schools considered valuable. This past year Mr. Toothaker, who has this matter in charge, has written to several county superintendents and asked them to designate to us the teachers in a particular county in the mixed common country schools, who would be most interested and most likely to use small collections in their schools. The names came in and we picked out eight or ten teachers in these counties and wrote to them and asked them if they could come in at a certain time in order to inform us what selections would be most useful in their schools. We asked them to come in on a Saturday, and told them that we would pay their fare, and they came. We turned those teachers loose on a great mass of material, and gave them pads and pencils, and asked them to jot down what would be useful to them. They spent the day with us. We wouldn't take the material which they made up or might have made up right there, but told them to take it home and consider it, and told them also that for their benefit we would send them other lists of the different kinds of material we had. We said to them: 'We want you to sum it all up and simmer it down to such small collections as you can use and take care of in your schools, something that will not be a burden to you, but that you can use every day.' We are waiting for those reports to come in now and we expect to circulate the exhibits among the small mixed country schools of Pennsylvania. That is one of the lines of educational work we are carrying on in that state.

"Now, we are having lectures for the schools about three a day in our museum We send out a circular stating that we will give 75 lectures on the geography of different countries, or on various commercial interests, for example, lumbering in the United States, compared with the lumbering interests in foreign countries, or the grain industry and what it means commercially to this country, compared with foreign countries. We send the circulars to the schools at the beginning of the year and ask them when they would like to bring their classes to the museum.

Three or four come every Saturday for that work. The lecture is given by one or two men who make it a special study and who are curators in our museum. After the lecture the pupils are taken into the geographical collection and spend from one to two hours there, divided up into groups and instructed by our people. This work has been going on for two or three years. Last year we had over ten thousand children coming in small groups from the schools.

"I wanted to bring this matter forward because I do not know whether any other state has taken up this question of attempting to get appropriations from the state legislatures, but it can be done, as is illustrated in our case I believe that in any state where the museum sets about it earnestly and shows what might be done, an appropriation can be obtained for that sort of work."

Mr. Toothaker.—"Dr. Wilson spoke of these collections being circulated. I think it would be a little clearer to say that these collections are given to the schools, and become their property. They are put in glass cases and you will often find the children in front of the cases studying the contents."

Secretary Rea.—"I have considered that matter carefully and have personally come to the conclusion that there is a decided advantage in the element of excitement in receiving an express package, and, furthermore, that teachers in country schools often change every year. Under these circumstances I find there is great danger that this material will be put into the corner and become rather familiar through the glass door and not so familiar in actual use.

"I would like to ask Dr. Wilson or Mr. Toothaker if they ever had any doubts as to the desirability of making the collection permanent in the school?"

Dr. Wilson.—"In the first place, we do not give the collection offhand. We send out blue prints and all that sort of thing and we do not give the collection until it is reported that the case is ready for it. The schools often have to do a good deal of work in the neighborhood and get up a good deal of excitement to get the money together to build the case, and in that way it is made quite an important matter and the teacher is glad to go ahead and use it."

Secretary Rea.—"How about the next teacher who inherits it?"

Dr. Wilson.—"We have not sent these collections out to schools where the teachers change in that way. They have gone to the high schools. We are trying the experiment now of sending them out to the little country schools where the teachers often change every year, and

we have that point to consider. We have already sent out 25 or 30 of these small collections. To these schools, since we are not restricted in regard to the money that is given us by the state, we are going to send out practically the whole exhibit. We have our own woodworking machinery and our own carpenters, six or eight of them who are employed the year round to install our own material, and we are going to make these cases ourselves, using the state money for that purpose, and put them in these small schools. We are trying to think of everything we can, and what trouble we are going to have about the collection disappearing I do not know, but we are trying to get from the superintendents and teachers throughout the state all the assistance they can lend us. They are enthusiastic in the matter and we are trying to get them to create a sentiment in that way, and we are going to show partiality towards those teachers first."

Mr. Roy W. Miner (American Museum of Natural History, New York).—"We have been sending out to various schools hundreds of these small collections, some containing birds, some containing specimens of minerals, some of trees and some of the various industries. We have not attempted placing the collections permanently in the various schools, but we have found that those which we have sent out have come back to us with the specimens in a more or less dilapidated condition from constant use. In our opinion, the temporary placing of these specimens in each school is a better plan on that account, not to save the specimens, but merely that we may keep tab on them and replace them as they begin to give out.

"We leave them in each school two weeks. Our wagon goes around at the end of that time, calls for the specimens and transfers them to the next school on the line, and in that way we keep them circulating. Provision is made for the return of the specimens to the museum from time to time, where they are replaced as needed and go out again, something like the circulation of currency We have, however, begun a scheme of placing more temporary collections in connection with the branch station of the public library where they will be better cared for and for a longer period of time; and where they can be utilized by teachers and pupils who may be in the vicinity of the library.

"I would like to ask Dr. Wilson what is done with regard to replacing specimens in the permanent cases."

Dr. Wilson.—"We have always held ourselves in readiness to replace material whenever it has worn out through constant use, as it must in time. This past year we inaugurated a system of sending out our men to every county in the state and attending the meetings of the teachers held

by the county superintendents, in order to become a little more familiar with the teachers and the whole system of the schools of the state and they have also visited and looked over the collections which we have already sent out and replaced or repaired the specimens wherever necessary. With these collections we have also, wherever possible, sent pictures, and wherever we could get a valuable picture we have printed duplicates ourselves and have sent those with the collections.

"I took home from the St. Louis International Exposition over ten tons of literature and a good deal of it was extremely valuable for the schools. I will mention in particular, the catalogue that was gotten up by the Chinese Government. It was a volume of 250 pages, which contained an immense amount of information. I took 1500 copies back with me to send out to the schools. I took home several tons of literature from the Philippine Islands, from New Zealand and from every country which had an illustrated catalogue containing information which I thought valuable. I sent these catalogues out to the schools, paying the express charges wherever our school collections have gone. We consider ourselves a sort of supply depot for anything that we think would be useful to the people of the state, wherever these collections have gone, and we hold ourselves ready to answer any sort of question that comes. We are getting just as close to them as we can and making all of them feel that we desire to aid them and are ready and willing at all times to render any assistance in our power."

The discussion of Mr. Rathmann's paper being concluded, on motion a recess was taken until 8 o'clock P.M.

SESSION OF TUESDAY, MAY 5

Evening

The Association reconvened at 8 P.M., President French in the chair.

ELECTION OF OFFICERS

President French.—"Pursuant to the report of the committee on program, we will now proceed with the next order of business which is the election by ballot of the officers for the ensuing year. Are there any suggestions?"

Mr. F. A. Lucas (*Brooklyn Institute Museums*).—"Mr. Chairman; I move you that the first ballot be an informal ballot for nominations."

The motion being seconded, was unanimously carried by a viva voce vote.

President French.—"We will proceed, gentlemen, to an informal ballot. I will ask Mr. Koehler and Mr. Baker to serve us in the capacity of tellers."

Upon request of Mr. Lucas, the Chair here ruled that the votes of institutions which are sustaining members may be cast by their chief executive officers or by properly accredited representatives, without invalidating the right of such representatives to vote again as active members.

The convention then proceeded to ballot for the nomination and election of officers for the ensuing term, the ballot resulting as follows:

President:

W. J. Holland, Director, Carnegie Institute, Department of the Museum, Pittsburgh, Pennsylvania.

Vice-president:

Frederick A. Lucas, Curator-in-Chief, Museums of Brooklyn Institute of Arts and Sciences, Brooklyn, New York.

Second Vice-president:

Frederick J. V. Skiff, Director, Field Museum of Natural History, Chicago, Illinois.

Secretary:

Paul M. Rea, Director, The Charleston Museum, Charleston, South Carolina.

Treasurer:

W. P. Wilson, Director, Philadelphia Museums, Philadelphia, Pennsylvania.

Councillors, 1908–1911:

William M. R. French, Director, The Art Institute of Chicago, Chicago, Illinois.

Henry L. Ward, Director, Public Museum of the City of Milwaukee, Milwaukee, Wisconsin.

At the conclusion of the applause which greeted the election of the respective officers, Mr. C. E. Akeley, Taxidermist-in-Chief, Field Museum of Natural History, read a paper, illustrated by lantern slides, on modern methods in taxidermy. Mr. Ward of the Milwaukee Public Museum then made the following remarks:

Mr. Ward.—"Mr. President and fellow members; I do not know how this address of Mr. Akeley's has appealed to you. To me it seems to be epoch marking. To one who has had to do with taxidermy and taxidermists as I have the secretiveness of these artists, the desire to keep hidden the processes by which they have achieved results unless perhaps they might give a half explanation to some friend or some museum director whom they felt would not come into competition with them has been a matter for regret. It has, however, been a common characteristic of the expert worker in many lines and is probably inherited from the old world craftsmen.

"In years past I have asked of preparators at the British Museum how certain things were done, how certain effects were produced, and for all the effect produced on the person questioned one might have thought him deaf and dumb. I have been positively refused admission to the workrooms in Paris of houses with whom the Ward Establishment had placed orders amounting to thousands of dollars from fear that I might learn some secret of their work. I have even had my own employees demur when I have asked them to show someone how something was done, saying that they did not wish to teach others what they knew. But here tonight we have listened to the man, of whom I can say without fear of accusation of flattery that he has done more for taxidermy in America than any other one person, give to us, friends, acquaintances and strangers, a full and detailed exposition of his method of mammalian taxidermy.

"I feel that tonight we have seen a breaking through of the old barriers of secretiveness that have not been a credit or an advantage to the individual taxidermist, to the museum that employed him, or to the art that he represented. It seems to me an important occasion and I am pleased to see a leader in the art take the lead in overturning this senseless system of secretiveness."

The following paper on the Lumiére Autochrom process of color photography by Mr. Fred. D. Maisch, photographer in the Philadelphia Museums, was read by Dr. W. P. Wilson, who also demonstrated a series of very beautiful lantern slides made by this process:

COLOR PHOTOGRAPHY

The Lumière Autochrom process of color photography depends upon the theory that approximately all color sensations can be produced by the primary colors: red, green and blue.

The preparation of the plates is as follows: A glass plate is coated with a gum or varnish having the same refractory index as the glass. Before this varnish has thoroughly dried it is completely covered with starch grains, averaging $\frac{1}{10}$ millimeter in diameter. These have previously been dyed with three aniline colors, orange-red, green, and blue-violet; then thoroughly mixed and dusted on to the plate. This layer is then rolled and pressed into a mosaic by a machine invented for the purpose, which at the same time fills up the spaces between the circumferences of neighboring starch grains with carbon dust. After another varnishing the plate is coated with the sensitive emulsion.

The plate is placed in the holder with the film away from the lens, so that the rays from the lens must first pass through the glass and the layer of starch before acting on the sensitive film. By this method the rays reflected from an object are divided into the three constituents, red, green and blue.

The exposure is necessarily prolonged, as about 75 per cent of actinic light is intercepted by the starch layer.

The first developing is carried out in absolute darkness using a pyrogallic acid and ammonia developer. This operation is accurately timed at $2\frac{1}{2}$ minutes. After a few seconds washing, the plate is immersed in a solution of potassium permanganate and sulphuric acid for 3 or 4 minutes in daylight. This solution has the faculty of dissolving the silver salt reduced in the first developer, leaving the white or unoxidized silver untouched. This process converts the negative into a positive.

The plate is then redeveloped in bright daylight, and afterwards intensified until the colors attain proper brilliancy.

In working with Autochrom plates one must endeavor to forget that reds are less actinic than blues, because the dyed starch grains tend to minimize the differences very greatly. In deciding on a necessary exposure one should take no account of any color shown in a subject, except yellow. Where yellow predominates the exposure should be materially lessened because it cannot be rendered as a pure color with the Autochrom plate. Blue, red and green each pass through but one set of starch grains and each of these colors represents just one-third of the available area of the plate; therefore, neither one of these colors should be favored in determining an exposure. Yellow on the other hand impresses the eye more vividly than any other color of the spectrum (leaving actinic value entirely out of the question), but passes through two sets of grains or two-thirds of the area. Therefore the exposure must be shortened within reasonable limits, trusting to intensification

in the pyro-silver bath to bring up the remaining colors in proper relation.

The ensuing discussion disclosed a very general interest in the possibilities of this process for illustration of museum lectures, especially in bird work. Slides prepared from Lumière plates are much less expensive and far better than hand-colored slides. The disadvantage arising from their greater density can be largely obviated, by the use of an adjustable rheostat.

On motion an adjournment was taken to meet at the Field Museum of Natural History at 10 o'clock A. M., on Wednesday.

SESSION OF WEDNESDAY, MAY 6

Morning

The convention reassembled at 10 o'clock A. M., at the Field Museum of Natural History, President French presiding.

President French.—"I now have the pleasure of introducing to you Mr. Harlow N. Higinbotham, president of the Field Museum of Natural History." (*Applause.*)

Mr. Harlow N. Higinbotham.—"Mr. President, Ladies and Gentlemen: Less than a score of years ago this spot was nothing more than a wilderness, a morass inhabited only by wild birds, lizards, snakes, and frogs, and we brought to this situation first a gentleman who sketched what might be done. We saw the sketch, we heard him explain it, and then if I quote from the Columbian code:

> 'We bade him rear our house of joy today;
> But beauty opened wide the way and he passed on.'

"Then came another captain, Mr. Burnham, with a host of assistants and means to put into execution that beautiful dream or sketch which had been outlined by Mr. Root. In a day almost, as it were, this situation was transformed from the wilderness to a thing of beauty that as memory refers to it cannot but be a joy forever. In its beneficent influence on art, on industry, and on the religions and thoughts of the people, on the courtesies and amenities of life, everything as we refer to it and remember it was all that we could have wished. It was par-excellence. It was visited by millions of people from all around the world who had helped to create it, and who had contributed their share.

"Later there came a suggestion from a gentleman in this presence, made to another who is also present, that there might come as a fruitage of that larger occasion, an institution that should cover some of the elements that were there collected, and preserve them as a nucleus around which to build something of this character. Those two gentlemen carried that suggestion to a man who made it possible that this thing should be. He too has passed on and he leaves this as a monument of his foresight and as an encouragement to us and to our city.

"We feel proud of what we have done here and we think we have a right to take pride in it. We have something here that we hope to add to and make greater and better and more beautiful and more useful. We are glad to have others with us to see what we have done and to let us help them if we can, and to beg them help us as much as they can, so that we may have, not only here but in other institutions of like character in this country, the very best that can be created. Only the best ought to satisfy us, and the best that we can give is at your service always. If there is anything by way of reference or by exchange or any other manner by which we can be of service to the other institutions of like character in this country, we are at your service, and we shall only ask and expect and hope for a reciprocation. We are all of one people and one heart and one thought and we ought to work together for the good of the great mass of humanity that may be benefited by what we do.

"I wish to extend to the art museums especially, our most cordial greetings and congratulations that they are with us, and if they can make any suggestions that may be of value to us, they will be very thankfully received. Beyond this I will not detain you longer, but will allow you to go on with your regular order of business." (*Applause.*)

President French.—"The members of the Association here accept with the greatest pleasure the hospitality of the Field Museum today.

Mr. Skiff has a word to say to us I believe; Mr Skiff, the coming Second Vice-President.' (*Applause.*)

Mr. Skiff.—"Thanking you for that reference, Mr. President, and my colleagues for the distinguished and unexpected honor that has been bestowed upon me, I desire in behalf of the staff of the Field Museum of Natural History to assure you that we are especially pleased to have with us our fellow workers, the men who not only do things with their minds and their hands, but who feel the responsibility of institutions of this character, who realize the opportunity and its responsibility for making an impression upon humankind, who know that they are building something that is going onward and upward, and, as it rises higher

and higher in importance, is uplifting and educating, as well as inspiring, the communities of the present who shall influence those to follow, and elevating their hopes for the future of the splendid work that will continue to grow and grow as the wind starts in a bush and sweeps the ocean.

"In behalf of the working force of the Museum, in behalf of my colleagues and dear friends who work with me each day and have done so, most of them, ever since we started, we are rejoiced to see you here. We hope that while you are in the Museum you will take up practical things, that you will discuss with us what we are doing with the opportunities we have; how we are securing and how we are handling material; in what way we are making it first entertaining and then instructive to the public; in what way we are assembling different units and making them tell the whole great story; how we give a scientific fact a popular interest and what we are doing in purely scientific work. I think it is these results of the meetings that more than anything else give value to our conventions. While, of course, we have great delight in coming here and listening to all these academic ideas so carefully prepared, but too often concealed in written papers—what we want to do is to get down to studying methods of reaching the common and often uneducated mind, to which, after all, we should and must most appeal and to which our labor will be, if properly done, of the greatest value. The casual young stroller in the museum may be the future scientist or artist.

"As I say, we are glad to have you here to discuss with us the work that we have in hand; the responsibilities that have been entrusted to us. The entire Museum is at your disposal. We hope that the sessions will be so regulated today that you will have an opportunity to go behind the scenes and visit our herbarium, our study collections, our alcohol room, our machine shop, our printing offices, our photograph rooms, our libraries, and to see our taxidermy. Let us get down to first principles if we can, today, and rub up against each other and get new ideas, new hopes, and work along together.

"Now, if anything I have said gives you the slightest conception of the pleasure it affords the workers in this institution, from the janitors up, to see the men who are our collaborators throughout the United States, to have them here with us, to share with us the satisfaction we all feel in having gotten so far in our purpose and mission, I still fear this expression can give you but an inadequate idea of our sentiments. Everything in the Museum is yours. We have moved out a few dead ones today to make room for you in Egyptian Hall, but as the very living fill

these silent places, in highly vitalized form, so from the lesson this transposition suggests, we can but reflect that history and fiction draw truth and story from the things that were.

"I bid you all a most affectionate welcome." (*Applause.*)

President French.—"Continuing the regular order of business, we will now listen to the reading of a paper by Mr. Edward K. Putnam of the Academy of Sciences of Davenport, Iowa."

THE EDUCATIONAL WORK OF THE DAVENPORT MUSEUM

As a local museum in a small city, the experiences, successes and failures of the Davenport Academy of Sciences during the forty years of its life may be of interest and help to other museums similarly located.[1] The Davenport Academy of Natural Sciences, as it was then called, was founded in 1867 in a western town of less than 20,000 inhabitants by four men, each of them interested in the advancement of science. For many years it continued in a small way, holding regular meetings at which papers were read and discussed. During this time the members brought together and built up the beginnings of a museum. As the years went on the scientific work and interest in the society expanded and in time it began the publication of its proceedings and also the erection of a museum building to house its constantly growing collections. For many years all the work for the Academy was done voluntarily by its interested members, but for the last fifteen years a curator has been employed on a small salary. Along with its other lines of activity, the Davenport Academy of Sciences has, from the very first, been influential in educational matters and in making its museum contribute toward education.

In these days when the educational value of museums is being recognized, it is interesting to turn back to the early records of the Academy and see how this educational value was uppermost in the ideas of the founders and in the activities of those who have carried on the work. In an address delivered by Dr. C. C. Parry, the eminent botantist, then president of the Academy of Sciences, March 12, 1869, less than two years after the founding of the Academy, he says that the two objects of such an institution are, first, to awaken a general interest in the observation

[1] For a suggestive paper on "The Function of the Provincial Museum," by Prof. C. C. Nutting, see Proceedings, Davenport Academy of Sciences X, 167–176.

and study of natural objects and, second, to stimulate research. This second object, he says, concerns the active scientific membership. The first concerns the relationship between such an institution and the community. Dr. Parry believed that much would be done toward arousing interest by having museums whose contents were accessible and attractive. These collections would convince the public that such objects are worthy of attention. He further expresses the hope that by means of such a museum and the interest aroused in it, direct results would come in the addition of natural science to the course of study in the schools.

> As I have had frequent occasion to remark, the educational claims of Natural Science are but very dimly appreciated, even in this utilitarian age and country, whose astonishing progress is largely due to the applied results of scientific investigation. . . Let the claims of Natural Science be once fairly admitted, and we shall have scores of teachers crowding within these halls, consulting our museums, and libraries, taking an active part in our exercises. . . No small honor will in after time attach to those who uphold the cause of science, as an educational power, during the period in which it is little esteemed, or regarded as visionary and Utopian in its aims and purposes.[1]

On another occasion[2] he remarks that such institutions as the Academy have a legitimate educational sphere, unappreciated though it may be, but none the less real. He is encouraged to hope that persistent efforts, aided and directed by experience, will be everywhere eventually successful, and an academy of sciences be recognized as "an essential part in the educational appliances of every intelligent community." These remarks by Dr. Parry are especially significant because he was the most eminent scientist among the early members of the Academy and the most influential in shaping and directing the growth of the young institution.

That Dr. Parry's plan for the development of education through the museum and the Academy bore fruit is shown by the later reports of the institution. Mr. W. H. Pratt, one of the founders of the Academy and one who gave much of his life toward its development, labored hard toward securing direct results by the introduction of scientific teaching in the public schools. A teacher in the public schools himself, he early appreciated the educational value of science teaching in developing the powers of observation. Officially and unofficially, the Academy, or members of the Academy, unceasingly sought to have science made a

[1] Proceedings, Davenport Academy of Sciences, I: 19–23.
[2] President's Address, Jan. 7, 1874. Proceedings, II, 356.

part of the course of study in the public schools and gradually these efforts resulted in success. Ten years after the foundation of the Academy, Mr. Pratt, in reviewing what had been accomplished, refers to the fact that natural history, physics, botany, zoölogy and physiology were now taught in the schools. Mr. Pratt went further still and at least as early as 1877 sought to have more vital connection between the museum and the public schools. When the Academy's own building was opened, he sought to make the museum directly educational by bringing the school children there, making the museum, as Rev. S. S. Hunting, then president, called it, "the ally of the public schools." At this time, in order to make the museum useful, Dr. Parry voluntarily conducted classes in botany and others did the same in other departments. When the Agassiz Association was organized the two chapters formed in Davenport held their meetings at the Academy. Mr Pratt next arranged to have classes from the public schools, both of the city and county, come more or less regularly to the Academy and to have himself or other members of the Academy explain some class of specimens to the children. This was at first done informally, but in 1889 the plan was taken up by the trustees of the Academy and a formal arrangement was made with the superintendent and principals of the schools by which classes from the eighth and ninth grades came regularly to the museum, Mr. Pratt, the curator, giving up a portion of every day to explaining the collections to the children and giving them lectures illustrated with specimens from the museum. During the year he gave over one hundred of these lessons, the average number of pupils in attendance being thirty-three. In addition he gave lessons to the school teachers, to classes from the schools of Moline and Rock Island, and to classes from the Orphans' Home, Kemper Hall and the Lend-A-Hand Club. J. B. Young, superintendent of the public schools, in his report of July 1889, made favorable mention of these lessons as a part of the public school instruction. Mr. Pratt was pleased with the result of the experiment, saying of it in a report to the trustees of the Academy, dated June 13, 1890:

"This plan of coöperation with the public schools, which is original with ourselves, met with the most cordial approbation of scientific persons and educators elsewhere, and has been favorably noticed in various scientific publications.

"Though it was an experiment previously untried, and has been carried out but to a limited extent as yet, it is already sufficient to fully demonstrate its feasibility, usefulness and popularity and to show unmistakably that it could be advantageously extended to one or two

lower grades, and that all might attend somewhat oftener—each class coming once in each month if no more.

"Having thus introduced this method and given it, as I believe, a fair and reasonably successful trial, my confidence in its usefulness and importance, both to the schools receiving instruction and to the institution affording it, is greater than ever; and I would here express the hope that it may be continued under still more favorable conditions, and become a regular system and part of the public school course of instruction, and may exert a strong influence in favor of an extension of natural science instruction in the school rooms."[1]

Unfortunately, circumstances the following year necessitated Mr. Pratt's removal from Davenport just at the time he was developing his favorite theory of making the Academy an efficient auxiliary to the public schools by using the museum for teaching from objects instead of from books.

Mr. Pratt was followed as curator by Prof. W. H. Barris, the geologist, for long years a member of the faculty of Griswold College in Davenport. While Dr. Barris did not keep up the plan of having classes come to the Academy regularly, he encouraged informal visits from classes and groups of children from the schools of Davenport and of neighboring cities, thereby testing what he called the "teaching qualities" of the museum. Dr. Barris died in 1901 and in the following year, while the curatorship was still vacant, Miss S. G. F. Sheldon voluntarily took up the instruction of school children at the museum.

Those interested in the Academy had all along felt strongly the importance of the educational work and the coöperation between the museum and the public schools. There is hardly a president's address from the days of Dr. Parry down that does not dwell upon this. Mrs. M. L. D. Putnam made a special plea for the educational value of the museum in her inaugural address as president in 1900. In selecting a new curator an effort was made to find one who would be qualified to carry on this part of the Academy activity. In April, 1902, Mr. J. H. Paarmann was engaged as curator and with the beginning of the school year of 1902, took up this school work and made it a vital feature of the Academy's usefulness. During the year 1903, all the public schools of the city went in classes to the Academy and in addition a regular class of teachers was organized for the study of natural history and in this way an intelligent interest in natural history was aroused among those most directly concerned with the development of the child mind. For two years Mr.

[1] Proceedings VI: 201.

Paarmann continued giving these talks at the museum to classes from the public schools and also giving lessons to teachers.

The value of this educational work was so appreciated and the results so obvious that in the year 1904 an arrangement was made between the school board of the city of Davenport and the trustees of the Academy of Sciences, by which the school board voted to employ the curator of the Academy of Sciences for one-half of his time to teach science in the public schools of the city. This arrangement has continued ever since and is still in force, the curator of the Academy devoting his forenoons to the public schools and his afternoons to the Academy.[1] The plan has the advantage of bringing the museum and the schools into the closest relationship, but would become more difficult in proportion to the size of the city. In Davenport, with a population of, say, 45,000, Mr. Paarmann is still able to visit all the fourteen graded schools personally, making the rounds once every three weeks. He gives from four to eight, usually five, talks at each school during a forenoon, and as two rooms ordinarily unite he reaches from 250 to 400 students a day. He takes with him specimens from the Academy museum to illustrate his talks. This arrangement has seemed more economical and effective than having all the talks at the museum itself. At certain times every year, however, classes from the upper grades do come to the museum where lectures are given, illustrated with objects from the museum, and in the spring time Mr. Paarmann takes classes of the older children to the Government Island, an almost ideal nature preserve, for the purpose of studying birds and their habits. The curator also endeavors, by special classes, by lectures at institutes, and in other ways, to train the teachers so that they can be of material help. The success of this method of coöperation between the Academy and the school board is shown not so much by the figures and statistics of classes, as by the increased interest of the individual children and the effect upon their educational development. All through the city the children almost count the days until the man from the Academy, or the "bird man" as he is frequently called, comes with his specimens to talk to them, and on Saturdays and Sundays large numbers of the children come to the Academy to see the more complete collections there, often bringing with them their parents.

Another result of this educational work of the museum has been the reaction on the museum, a reaction which benefits the older members

[1] For Mr. Paarmann's reports see Proceedings IX: 295–6, 308–9; X: 180, 188–9, 197–8, and also the report for 1907 to be printed in Vol. XI.

of the community as well as the children. It becomes evident that a local museum, used as the Davenport museum is, must almost necessarily be so arranged as to attract the eye and leave some intelligent impression. Moreover, the museum must be added to, so that those objects which are useful for the public school work will not be lacking. Thus during this year much has been done toward building up a commercial and industrial department which has proved to be of very great interest not only to the school children but to the general public.

Such in brief is an outline of the educational work of the Davenport Academy of Sciences. What has been accomplished during the forty years of the Academy's existence, shows that still more may be done. The results even now have proved the soundness of Dr. Parry's idea of forty years ago, that an institution like the Davenport Academy of Sciences could through its museum and in other ways be a positive factor in the educational system of the city. The results have further proved the practicability of Mr. Pratt's scheme for active coöperation between the museum and the public schools. With the new fireproof building which the museum needs and hopes for, and with the substantial endowment which is now assured for the future, the Academy of Sciences confidently looks forward to still greater usefulness in the intellectual uplifting of the community.

President French.—"Are there any questions or suggestions in regard to the paper?"

Mr. E. E. Blackman (State Historical Society, Lincoln, Neb.).—"Mr. Pesident; I want to bring before this meeting something of the result of those talks given by Mr. Pratt years ago in the Academy of Sciences of Davenport. As a boy, ten years old, I lived in that community, and the delight of my life was to listen to the talks delivered by that grand old man. From the little start which I received there, together with the interest which was aroused by Mr. Hall, a gentleman who collected largely for the Academy, my interest has always continued in that line of science, and especially in art galleries. I attribute my later work to the seed sown at these lectures by Mr. Pratt.

"I want to say that the far-reaching value of such things cannot be estimated in dollars and cents. You cannot estimate the satisfaction which I have received from the power to study my surroundings during my many years of school life. If I succeed in building up a museum in the state of Nebraska which shall be a monument in that state, the credit

must be given to that grand old man, Mr. Pratt, who gave those talks in the Academy of Sciences."

President French.—"Mr. Blackman's testimonial is certainly a very direct one to the value of such work."

Mr. Putnam.—"Of course, in a small city we have an advantage over a larger city in this work, because we can come in much closer contact with the children than is possible in a great city. I appreciate also what Mr. Blackman says about Dr. Pratt, and he is not the only one who has been influenced by those talks in the early days."

Mr. Frank C. Baker (*The Chicago Academy of Sciences*).—"Possibly very few of us appreciate the value of an academy of science in stimulating the minds of young people to the opportunities of studying nature, and the remarks of the last gentleman call to my mind some instances in connection with the Chicago Academy of Sciences.

"I can think of four young men at the present moment, and I believe there are more, who, during the last fifteen years since the academy building has been in Lincoln Park, have been started out in nature study,and two of those are now in the State University taking courses along that line, as a direct result of the encouragement given at the Academy of Sciences. That shows the advantage of having such an institution to stimulate the interest of young people. One of these young men was interested in the study of molluscs and I had the pleasure of starting him in that work. I think he may possibly make a remarkable man in the course of time.

"Then there are two questions which came into my mind that I would like to ask Mr. Putnam: Am I to understand that you have loan collections?"

Mr. Putnam.—"No, we have no loan collections. We are encouraging some schools to build up collections themselves, because it is interesting for them and they take pride in having their own little collections."

Mr. Baker.—"There is another question I wish to ask, and that is, when the classes visit the school, do they have any preparation from the teacher beforehand or do they come down on you at any time without any previous arrangement?"

Mr. Putnam.—"That is all arranged beforehand. Mrs. Palmer is engaged now in visiting the schools. A well organized program is carried out and the classes coming to the Academy are arranged for beforehand. We have also a great many classes coming from the country schools and across the river outside the city."

Mr. Baker.—"The reason I asked that question is that if a teacher

comes with a class without preparation, the class wanders all over the place. Possibly Mr. Skiff has noticed the same thing in the museum here. It looks at anything it wishes to, and there are no results from the visit. If the teacher comes after a definite preparation, and has, as in a case I have in mind at the Academy, slips of paper made out and given to each pupil and the pupil is required to do a certain amount of work during the visit, then something is accomplished. Where teacher and class come possibly twenty-five or thirty miles and they are turned loose to wander about the museum, no good results are accomplished."

Miss Anna B. Gallup (Children's Museum, Brooklyn).—"I do not think there is no benefit to be derived in turning the class loose in the museum without preparation. At least, in our museum in Brooklyn a great many teachers have come without preparation and turned their classes loose, and that first visit has proved a stimulus to other visits, and to visits which were prepared for, perhaps. If little children who have never come to a museum before are allowed to wander around and pick out what they like, the chances are they will become interested and want to come to the museum again, and very often in Brooklyn they will work upon the teachers until they force them to bring the classes with them."

Mr. Putnam.—"I am trying to make the work at Davenport just as practical as possible. Last fall we were troubled very much with the white moth which was destroying the foliage of our trees. Thinking it might be well to bring that matter up before the children, I got a lot of material together on the subject for presentation at the various schools, and showed the children how to collect the eggs of the white moth. Then I had the teachers report as to the number of eggs the children brought into the schools, and found that on an average about 160,000 eggs were collected by every room in the schools in Davenport. That means a decrease in caterpillars in Davenport this year.

"Then we were troubled by the birch bark borers which were destroying our white birch trees. We found that the woodpeckers were the only enemy of the birch bark borers and that gave an opportunity of taking up the study of the woodpecker.

"An opportunity was offered for the study of landscape gardening and I got a list of books from the agricultural department which I gave to the children, telling them they could obtain those books free. I think the Department of Agriculture has been sending some 20,000 books to our children in Davenport, according to the reports of the letter carriers, and I believe that the children have been getting some good therefrom.

"Some peculiar things come up in this work. I was giving a lecture on birds in the first and second grades, and the teacher had been talking about birds and had pictures of them hung all around the room. I said to her, 'I am going to find out now if the children can recognize the birds that are presented in these pictures.' I held up a male cow bird, and I said, 'Do you know what that is?' Oh, yes, they knew what it was and held up their hands and shouted out 'Wild turkey.' I asked, 'How do you know that is a wild turkey?' and they pointed out a picture of a wild turkey, and I was surprised myself to see the resemblance, eliminating the size. That is the objection to pictures; they do not give an idea of correct size."

Mr. Ira B. Meyers (*School of Education, Chicago University*).—"In connection with the discussion last night of what we might call elementary educational work, it seems to me that there are two principles which are vital in the museum movement. They came out some years ago in some work I was trying to do with children whom I had brought to the museum to look over the splendid exhibits. While they did enjoy the exhibits, they did not seem to find the intellectual meaning that they should. We went back and started the children collecting material themselves, and writing up some little histories of frogs and things of that kind. They spent a good deal of time on it, and we soon found in that way that they gained some appreciation of the life of these things, and of the work it requires to get them in shape so that they really look natural when they are put on exhibition. After we had been at that work probably a month we took the children back to the museum and found a marked difference in their appreciation of the exhibits.

"It seems to me, therefore, that it is a good plan to recognize that the children must have some experience along these lines in order to appreciate the work that is being done in the museums. Let the children work out the process in our steel works from the raw ore to the finished product, for example, and then bring them to the institution and they begin to have an intellectual appreciation that is something more than a mere sense of curiosity. Of course curiosity must be the thing which first leads children so examine these things, but unless that curiosity is transformed into intellectual appreciation, we shall not succeed in this work, and I am so vitally interested in it that I wish to see more done in our public schools until we have the movement on a footing that will stand against any opposition that may arise from any source."

Mr. James E. Talmage (*Deseret Museum, Salt Lake City, Utah*).—"The paper to which we last listened is particularly interesting to me

from the fact that it emphasizes the part of museum work that has to do with the many rather than with the few. I admit the great importance of the specialist's work in museum advancement, yet I regard the museum as an institution peculiarly adapted to the education of the masses. It has been said that the teacher is he who stands between the specialist and the people, he who takes from the master's hand the bread of truth and distributes it to the waiting multitude. In a general way this position of the teacher among men is occupied by the museum among institutions.

"It is within the proper function of museums to foster and to promote in every way possible the work of original research, investigation, exploration and discovery in the realm of the unknown. But the museum that has done all this has but in part discharged its duty. The results achieved by investigator and explorer are to be systematized, collated and brought within the reach of the people at large.

"The disfavor manifested by some for what has been somewhat derisively termed popular education is not always well founded. If by popular education we mean that which is superficial and injuriously incomplete there may be good reason to decry it; but if popular education includes bringing to the masses such truths as they can profit by, then this phase of popular education is to be commended.

"A smattering of knowledge may lead to ill if it be regarded as more than it is; but a little good is better than no good at all. The paper by Mr. Putnam has shown us what a comparatively small museum can do in connection with the public schools—in instructing the children and through them the parents.

"The relation of the museum to the public schools received attention at our organization meeting in New York; the subject was not forgotten at the Pittsburg meeting a year ago; I am glad that it has been brought before the Association at this gathering. The museum is a close associate of the common schools, which deal with the masses, as also of the universities, which deal with the few."

President French.—"The next order of business is a discussion of the adaptation of buildings to the work of museums, which will be opened by Mr. Skiff and illustrated by plans of the proposed new Field Museum of Natural History, which will be explained by Mr. Theodore Lescher. I have pleasure in again presenting Mr. Skiff. (*Applause.*)

DEMONSTRATION OF PLANS OF THE NEW FIELD MUSEUM OF NATURAL HISTORY

Mr. Skiff.—"Mr. Field, the patron of this institution at his death, January 16, two years ago, left to this museum eight millions of dollars, four millions for endowment and maintenance and four millions for a new building, stating in the will that a free site must be obtained by the Museum for its building within six years of his death if this four million dollars was to be reserved for that purpose. This gave the city six years to provide a site. In this provision Mr. Field announced his belief that the present building would serve the purpose of the Museum for no longer a period than six years, and in this he was more than correct.

"The South Park Commissioners, under an act of the Legislature, gave the Museum a location on the Lake Front at the end of Congress Street extended,—Congress Street being the thoroughfare between the two Auditorium Hotels,—in a park called Grant Park, made by filling in the lake to the extent of about two hundred acres. The location of the building is to be about 300 feet east of the Illinois Central right-of-way and to extend north and south so as ultimately to cover two blocks, with Congress Street opposite the center. An injunction has been obtained by a citizen of Chicago, who has taken advantage of some clause in an early dedication of the land, and who objects to having any buildings of any character whatsoever erected on the Lake Front, and this question is now in the courts. The indications are that it will be decided as the people of Chicago desire it to be decided, almost unanimously, in favor of the Museum.

"In the meantime the architects, D. H. Burnham & Company, have designed the new building. The plans have been approved by the staff of the Museum, by the trustees of the Museum, and by the Board of South Park Commissioners. In fact for more than a year before Mr. Field's death, and almost continuously since then, everybody interested has been at work with the architects in perfecting the plans of the building in every detail.

"At my request, approved by President French, and in view of the special features of the program suggested by Mr. Rea, Mr. Lescher is here this morning as the representative of the architects with some of the plans. The larger water color drawings that he had hoped to exhibit, and which would have given you a more comprehensive idea of the entire scheme, he was unable to bring on account of the rainy weather we have been having.

"With these words of explanation, and with an expression of gratitude to Messrs. D. H. Burnham & Company for taking all this trouble I have the pleasure of introducing Mr. Lescher who has been in charge of the design of the building." (*Applause.*)

Mr. Theodore Lescher.—"In thanking the architects for their trouble Mr. Skiff forgot for a moment what an extreme pleasure it is for them to explain their work to those who have expressed an interest in it. I do not know of a better place to begin this pleasant task than with the general elevation and by calling your attention to the fact that it resembles in a certain degree the building we are now in.

"It was evident, after the Museum had become a fixture in Chicago, and the people had become much attached to the present building in spite of the fact that it does not suit the requirements of the Museum, that it would be very fitting to take this building as it stands as the starting point for the exterior of the new one. It has been held by art critics since the World's Fair, that this building is perhaps as perfect a one as has been designed since the old Greek times. Augustus St. Gaudens, who was an exquisite critic of proportion and detail, not only of his own work in sculpture, but also of architecture, unqualifiedly said that it was the most beautiful building since the time of the Parthenon. So there were strong reasons for using it as the starting point and bending our efforts to adapt it to museum needs.

"The elevation before us takes in only the central portion of the new building—everything in the way of wings has been omitted, but it is hoped at some future time to add them, and in expending the appropriation Mr. Higinbotham has wisely made a provision for reserving a certain part of the interest, and perhaps of the principal, which can be used in building the wings at a later date.

"The main entrance pavilion of the building is directly opposite Congress Street, the street which has the Auditorium Hotel on one side and the Auditorium Annex on the other. The small perspective gives the exact location on the prolongation of Congress Street toward the east. You will notice a great many things on this drawing which do not exist in Chicago at present, as this is one of the plans that the Commercial Club Committee, under Mr. Burnham's directions, is working out for a more beautiful Chicago. They are looking into the future to a considerable extent, but although certain parts do not exist, the particular portion called Grant Park does exist, and the drawing shows you Michigan Avenue, 12th Street, the river, the Auditorium and opposite it the mass of the Museum. The ground which surrounds it,

and which will be treated as a setting for the Museum, has already been filled in.

"Mr. Skiff suggested that I bring to the meeting a number of large drawings which are being made for the Commercial Club plan, but, as he has explained, we were unable to do so on account of the rainy weather. Some of these drawings are in the neighborhood of twenty feet in length, especially an immense perspective showing the treatment of the Lake Front from the river to where we are now—a distance of from six to eight miles. There was no wagon long enough to enclose them and there seemed to be no way of protecting them against the wind and the rain, and as they represent an expenditure of several thousand dollars it was deemed wiser to keep them under cover.

"Having told you the inspiration for the exterior of the building, the next step is to get into the interior. The plans of the museums of all the countries in the world were studied very carefully. All the data that could be found concerning these museums and the method of handling the material which they were designed to house, was studied in detail, and the rather startling conclusion developed that there was nowhere a perfect museum in existence at the present time. There were parts of two or three which came pretty close to perfection and one of them happens to be here in Chicago,—The Academy of Sciences, planned on lines which are very good indeed, although the proportions of the building are much smaller than should be recommended. The American Museum of New York has certain halls which are very good indeed, and there are things about the new Brooklyn Museum which come near the point of perfection for certain purposes, so we have considered ourselves fortunate in having all this experience so near at hand, and have tried to profit by it to the utmost extent.

"The main point which was always kept in mind in planning the museum is the fact that a museum is a treasure house of a great many cases and a great many boxes. These cases as a rule are of standard sizes. In the present Field Museum they are twelve feet long and two, four, six and eight feet wide. In is the concensus of opinion, I think, of the present day critics of museum buildings that side lighting for all cases is the best to adopt, using the skylighted hall for very large objects only, or where it is absolutely necessary to use top light. Keeping this in mind the spacing of the front columns and of the windows was laid out with reference to the cases that they were going to accommodate, and you will notice on the different floor plans that the piers are made wide enough in every instance to receive the end of a six foot museum

case. From each one of the piers the cases will extend into the hall, forming alcoves, and this principle is carried out in all parts of the building.

"From the entrance we go into a central distributing hall which is carried up through the three stories of the building. On each side of it are great arches opening directly into the Exhibition Halls, so that there is very little chance of losing one's way. By means of signs it will be very easy to direct the people from this central hall into the different divisions of the Museum without loss of time. Once through these arches the visitor is in the long Exhibition Halls, of which there are four in the width of the building. These halls are about forty-two feet in width, and irrespective of the subdivisions or partitions, they are in the neighborhood of two hundred feet long. They are all alike and are connected at the ends by transverse halls of similar width, similarly treated.

"Another vital point which we have considered in planning these halls, and in which we were helped by the lay of the land, is the fact that the majority of long halls in the Museum can lie with the long axis North and South; in this latitude this arrangement gives very much the best light. The spaces between the long halls were originally open courts in a preliminary plan which was made for the Museum, but it was found that this space could be utilized by running the main floor of the building from west wall to east wall uninterruptedly. At the level of the second floor an improved type of skylight was planned, giving the maximum of light and consisting of a single thickness of glass, which may be easily kept clean. This is as perfect a type of skylight as has been developed and will be used in the three courts on each side of the central hall of the building. In looking at the main floor of the building you may consider it as one immense floor space from end to end and from side to side, simply broken up into halls by the piers which receive the ends of the cases. The different exhibits will be separated by screens just high enough to cut off the view from one exhibit into the next, but without cutting off the light or enclosing these exhibits in small stuffy rooms as is often done.

"Near the entrance vestibule on the main floor we have located the director's suite of offices, consisting of the director's office, ante-room and private office; the working office of the recorder and the general office are nearby; and on the floor just below and on a level with the ground outside, are further offices for carrying on administrative work of the Museum. On the opposite side of the entrance is a series of

rooms given up to the Trustees and forming a pendant to the director's suite.

"In order to get the people to and from the different floors of the Museum, the stairs have been located very conveniently at the entrances to the long halls. In fact not only have the stairs been kept at these points, but all of the wire and pipe shafts, the cut-out boxes, fire mains, and the rest of those little disagreeable things which are so necessary, have been kept in these particular places and hidden from view. As you go through the entrances you see the stairs, which is the important thing, and you pass into the next hall without feeling that it is disfigured by these innumerable practical things which form the nerves, the alimentary canal and that sort of thing in the building.

"Another point which should have been mentioned is, that as soon as the visitor reaches the main vestibule he sees a very important stairway leading to the second floor so that it is impressed upon him then and there that the Museum occupies at least two floors and that the public is expected to visit them. This idea is further emphasized by a great stairway at the far end of the central hall which he sees immediately on entering. On the main floor is found also the Library Reading Room occupying a place near the east entrance, with its Stack Room on the floor below it, and connected by a dumb waiter service. A small lecture hall seating about two hundred people is also located near this entrance.

"The second floor plan is exactly the same in general lines as the one below it, with the exception that the courts which I have called your attention to as being skylighted, are open to the sky, the glass surface of the skylight being below the sill of the windows in this story. The stairs, pipe shafts, etc., are kept in the same relative places, and the maximum light is obtained at the short ends of the courts by making a very small connecting passage with the neighboring halls. At the ends of the courts we have five large windows so that there is a minimum of lost light, due to one portion of the building abutting against another.

"On this second floor the central hall is an open space surrounded by a gallery. As it is the great show hall and the great distributing room of the building it is necessary to give it sufficient architectural importance to express its function and the aim of the building. The gallery provides the circulation around the ends of this great hall from one side of the building to the other.

"The division into departments of the Museum is as follows:

"The Departments of Zoölogy and Anthropology are on the main floor, each one occupying half of the building, and the central hall is

given up to the great objects of those departments. On the second floor at least two of the long halls will be given up to Zoölogy and Anthropology and the rest of the second floor will be divided equally between the departments of Botany and Geology.

"The third floor is the working floor of the Museum. It is here that the curators will have their offices, and that almost the entire working force of the scientific staff of the Museum will be installed. The divisions as they are laid out on this plan represent the divisions given to the architects by the curators themselves. The curators' offices will be in the four corners of the central division of the building, easily accessible from the central hall. Each curator has, as his working department, one-quarter of the third floor of the building, just above his exhibition halls. It is the intention to make these quarters as comfortable as possible. They have as good light as the public exhibition halls of the building, and the offices will be comparable to those in the best office buildings that are now being erected.

"The point which Mr. Skiff has mentioned and which would have been covered by the large scale drawings we are not able to show you, is the relation of this building and its setting to the boulevard scheme of Chicago. Grant Park, which is now entirely filled in and partly planted with shrubs and trees, is really the heart of the great boulevard and park system of Chicago. This system is being developed, not only in the present built-up section of the city, but is being carried out many miles into the country. The radii of roads which are being considered in connection with it as great outer girdles, extend in the shape of a fan about forty-five miles from the heart of the city, with the Museum as a center. It was decided that the building is important enough to be placed in this unequaled location, and the point which Mr. Skiff wished to insist upon is that public buildings of this class should be intimately connected with the things which make a City Beautiful, and should not be hidden away in corners and forgotten.

"This figure shows the connection between the Museum in Grant Park and the great island park which it is proposed to build at some future time along the whole lake front of the South side as far as Jackson Park. The lake front at present is given up to railroads. It is proposed to build an island about five hundred feet wide, leaving a waterway also about five hundred feet wide between it and the present shore line. The figure also shows in a feeble way, the great plaza in front of the Museum and the splendid setting that the building will have.

In a general way we can say that the building is 350 by 700 feet, out-

side dimensions. The floor area given up to museum purposes will be about 750,000 square feet; this includes the working space and the public space. As you have seen by the plans, a little more space is given to the public than to the working force. In comparing this museum with others in this country we find the New York Museum to be the largest; it has one million square feet—perhaps more. The museums in Washington at the present time have something under this figure. The new museum in Brooklyn, when completed, will have 600,000 square feet, so that the Field Museum will take third place, unless Mr. Higinbotham's interest develops to such an extent that the wings may be added."

Mr. Higinbotham.—"Tell them about the wings and how they will be added, in reference to the fore-courts, etc."

Mr. Lescher.—"You will notice that there is an open plaza in front of the building, made by extending Michigan Avenue toward the east and building over the Illinois Central tracks directly up to the entrance of the building, so that there will be no separation as is the case at present.

"This will create a great Plaza which we can only compare to the Place de la Concorde in Paris. Later, when the additions or wings are built, they will be connected near the front of the building and will extend toward Michigan Avenue on each side. There will then be a fore-court at the west of the Museum framed in on three sides; it can be very beautifully treated with a mosaic pavement of different colors and by means of balustrades and other park architectural motifs, and in connection with the great plaza can be made one of the most monumental compositions in the country, or perhaps in the world. At least, it is the intention of everyone interested to make it so."

Mr. Higinbotham.—"Those annexes are to extend east along the end of the main building?"

Mr. Lescher.—"There have been several schemes proposed for adding the wings; I have simply mentioned one of them. It is possible to extend back also, as Mr. Higginbotham suggests, depending on the amount of money, I should say, that will be at the disposal of those who are in charge of the work."

Mr. Higinbotham.—"I think, depending upon the amount of space that will be required." (*Applause.*)

Mr. Lescher.—"The two are closely connected, but there are great possibilities in any case, and in planning the building, the Museum has very wisely left for itself a greater area than the main building will cover so that it can be extended in any direction."

Mr. Higinbotham.—"On its own grounds?"

Mr. Lescher.—"On its own grounds."

Mr. Skiff.—"Did you explain the arrangement of the columns on the front so as to avoid darkening the rooms?"

Mr. Lescher.—"In a previous scheme for the building we had a colonnade along the front. Architects have been very severely criticized by museum people for paying too much attention to architecture and not enough to museum conditions. You read in every critisicm of a museum that the exhibits suffer from want of light and from a number of other causes because the architect wanted to do architecture instead of building a museum. I feel it my duty to tell you, whether you believe it or not, that this has largely ceased to be true. Within the last half century it has become safe to entrust almost any well known architect with a building of this character, and he will plan it in such a way that the aim of the building is his first consideration, and the beauty of the architecture second.

"We have worked along those lines in this building; at the same time it was everyone's idea that the central placing of the building demanded that it should be given a monumental character, and for that reason more expenditure is represented in the exterior elevation of the building than otherwise would have been necessary had it not been in such a location. The idea is that everyone who comes to Chicago will see this building; will see it many times and learn from it, if it is beautiful enough; then they will go away feeling that they know more about architecture and will perhaps take the lesson with them to all parts of the country. It was on this account that the colonnade, which costs a little more than a regular wall pierced with windows, was put into the building, but, in order not to let it detract from the light, the wall has been brought very close to the columns. This was studied with the idea of giving the effect of a colonnade without having the deep shadow that a real colonnade would give. At the entrance, however, there is a real colonnade, the idea being to impress upon the persons entering the building that they are going into a great monument, a place of importance, an institution worthy of their consideration and thought." (*Applause.*)

At the conclusion of Mr. Lescher's remarks, in response to queries addressed him by various members of the Association, he explained further the details of the plan as follows:

"A very thorough system of artificial ventilation was devised for the building, but it was found that it would cost an immense sum of money if perfected according to modern plans, with air ducts installed at very

close intervals all over the building. The air was to be washed as it came in, forced into the rooms and then drawn out, thus requiring two separate sets of ducts. In trying to reduce the expense we had to face the problem of an imperfect thing, and the engineers finally gave it as their opinion, that unless the most highly developed system of ventilation were installed, it was practically useless to put in any scheme other than the natural ventilation by the windows. That is why the plans as shown here show no details of ventilation at all.

"As to the heating of the building, the question of expense came in again. The ideal arrangement would be a heating plant located outside of the building, and all the pipes brought in through tunnels with the smoke stack some distance away from the building. It is hoped that at a later date this may be done; that perhaps the Art Institute may coöperate with the Museum and the South Park Commissioners and establish a central power plant somewhere in the park and supply the Art Institute, the Museum and the park buildings with light and heat.

"The location of such buildings as the Crerar Library and others, has not been definitely settled, but it is hoped that everyone interested in them will work in accordance with the Chicago plan and decide on a location which will fit into that plan, or, if that is impossible, make the plan fit into the location.

"The bids for the Museum building will be taken on granite, which in this smoky atmosphere can be cleaned to its original color, and also on a cheaper stone, like the Bedford, which does not keep its original color, but becomes a very agreeable color in time.

"The floors will all be of cement, except the working floor in the third story, which will be of wood, as there will be much running about, and it was thought wiser to give the men a wooden floor on account of its greater elasticity. The cement will be treated in such a way that the dust will be done away with to a great extent.

"I neglected to mention that in the little corners where all of our pipes, etc., are located, we have the latest improved pneumatic cleaning system for taking dust off the floors by means of a little device which sucks it up and delivers it in the basement; we will also have an improved scrubbing system which works in very much the same manner. The water comes out of a squeegee, as they call it, and when one is through scrubbing it is drawn back again into the squeegee and disappears.

"To go back to the cement floors, there is a paint for treating them, the name of which I have forgotten, but this paint sinks into the cement and hardens it so that no dust is formed by walking on it. There is no

objection to a tile floor, in fact it would probably be preferable to cement, except in the matter of expense. It is simply a question of whether a dollar or twenty cents shall be expended for each square foot, and when you take into consideration an area of 750,000 square feet, the difference amounts to quite a large sum. Linoleum was never considered, but we have considered using a material that goes under different names: one form is called Asbestone and another is called Flexolith. It is a material made in some combination that permits it to be spread on like cement or plaster: it can be put down over a wood floor. The question of expense, however, came in. The wood floor can be laid for fifteen cents a square foot, and the other costs about thirty-five cents.

"The windows in the public exhibition halls are fixed firmly in place; they are put in once for all, screwed firmly into place, with the exception of a hinged sash at the bottom which can be opened for cleaning the window and for ventilation when needed. All of the windows on the court side and on the outside are treated in that way. That is done to keep out all the dust we possibly can.

The basement of the building is exactly on the level of the ground outside. At the south end of the building are the Lecture Halls. The entrance is on the ground level through three doors into the vestibule and from there into a great lecture hall holding twelve hundred people. From the same vestibule access is had to another lecture hall seating six hundred people. All the lecture hall part of the building is thus taken care of through its own exterior entrance from one vestibule at the south end of the building. The location below the main floor of the building makes it impossible to give this lecture hall natural ventilation, and so it will be ventilated artificially, as in theatres. The smaller lecture hall has outside light and the same forced ventilation. The large lecture hall, at its highest point, where the floor begins to slope down toward the stage, will be about twenty-two to twenty-four feet in height, and from there it slopes down to the stage where the total height will be about thirty-five feet.

"We hope to have an abatement of the smoke nuisance, but we are not counting on it. The question is a serious one in this location, with the Illinois Central Railroad within three hundred feet of the building, but steps have been taken to combat this by making the windows as nearly air tight as possible.

"As to the question of having the Museum located in a suburban park, as at present, or placing it in the dirty down-town portion of the city, I believe there would be considerable difference of opinion; but I think

if you ask Mr. Higinbotham's opinion, he would emphasize the advantage of bringing it nearer to the heart of the city where all the lines of transportation come in, and where it can be visited by many times the number of people that now visit it. In other words, it is a question of its usefulness.

"The question of dampness throughout the building has been taken care of by lining all outside walls with hollow brick, thus providing an air space; the basement is also provided with hollow brick and with asphalt waterproofing to further obviate any dampness; so I think we are perfectly safe in saying that there will be no trouble.

"As to an areaway at the windows of a building of this character; no matter how carefully it is built it will be full of waste papers and dust, and we have entirely avoided using it. It does not look well in a monumental building, giving one the impression that the building has sunk down below the level of the ground."

This concluding the morning exercises, the Association adjourned for an automobile ride through Washington and Jackson parks, and a luncheon at the South Shore Country Club as guests of the Field Museum of Natural History.

SESSION OF WEDNESDAY, MAY 6

Afternoon

The Association reconvened at the Field Museum of Natural History at 3:45 o'clock, Vice-President Lucas in the chair. The regular order of business was taken up as follows:

REPORT OF AUDITING COMMITTEE

Chairman Lucas.—"The first business in order is the report of the Auditing Committee."

Dr. Oliver C. Farrington (*Field Museum of Natural History, Chicago*). —"As chairman of that committee I desire to report that the committee has done its best to find some defect in the report of the treasurer, but it has been unable to do so and it is therefore compelled to approve his report." (*Laughter.*)

On motion duly seconded and carried the report was adopted.

Chairman Lucas then called for the submission of papers and the following was read by Miss Anna Billings Gallup, curator, the Children's Museum, Brooklyn Institute of Arts and Sciences.

THE ESSENTIALS OF A CHILDREN'S MUSEUM BUILDING

In trying to utilize an old residence, never intended for public uses, for the work of a rapidly growing institution, one's ingenuity is taxed to its utmost every day, and needs of which one would scarcely be conscious were he to plan Children's Museum quarters without first having had this experience, suggest themselves at every hand.

In this paper I wish to enumerate some of the special needs for Children's Museum equipment in addition to the usual necessities recognized for every museum.

These are:

1. A commodious lecture room
2. A work room laboratory
3. A room for temporary exhibits
4. A light, spacious and well ventilated coat room
5. Adequate toilet accommodations.

1. The lecture room is as necessary as are the museum exhibits, and in our museum is used almost as constantly.

It is a place where we assemble the children to give lectures and to explain models, specimens, and apparatus. Children are not satisfied with mere exhibits, they look at them and enjoy them, but their interest is held and increased only in proportion as exhibits can be correlated with some form of activity.

The lecture room should be large enough to seat comfortably the classes that come from the schools for lessons and lectures, and it should be available for any gatherings that may be held in the interest of the museum and its work.

2. A work room laboratory would never lack use in a live children's museum, for children would always find it a convenient place to pursue their favorite subjects.

In this work room, the boy entomologist could care for his cocoons and caterpillars, and would learn how to preserve and mount his insects. If he should learn to use the microscope he would find another world of interest.

The child whose interest is in the plant world would germinate seeds, care for bulbs, press and mount plants, or study the spores of mosses and fungi with the microscope.

Boys who like physics and electricity would work at their problems, and so on.

3. The room for temporary exhibits would always attract attention and hold interest because of the variety and change. Here the visitor would look for the bird residents and migrants of the locality, month by month. The procession of wild flowers from the opening of the first skunk cabbage until the fall of the last autumn leaf would occupy the flower tables. Tadpoles, dragonfly larvæ, spiders, grasshoppers, crickets and all such seasonal visitors would be regularly expected. Children would exhibit their work, objects loaned to the museum could be displayed and information concerning matters of world wide interest could be emphasized.

4. The subject of coat room accommodations might not occur to anyone who has not dealt with children in large numbers, but from a hygienic point of view, this is as important as fresh air and light.

In winter, especially, when teachers arrive with from 50 to 80 children, they may wish to hear a lecture and then spend an hour visiting the museum. The ease and comfort of such a visit are greatly enhanced and much weariness of body and soul prevented, if at the outset the children can be taken to a coat room to leave their garments under lock and key. In this way the energy that would otherwise be wasted in hunting for lost gloves, pocket books, collars, etc., and in the effort to keep comfortable in a building too warm for outside wraps, can be used for the object of the visit.

I am speaking now of a city museum which has to deal with large numbers of children, many of whom travel long distances to reach the museum.

5. Children are so active and run so much, especially when on a pleasure trip, that a class never leaves the museum without making requisition on the water fountain. When each one of 80 children is thirsty the time consumed in furnishing the water supply is no small consideration.

The question of toilet accommodations is highly important for the children who come long distances, and a museum has no more right to ignore this convenience for the health of the children than has the public school. All of these matters of architectural detail are of the utmost importance when it comes to the practical administration of a public institution which has great numbers of children to serve.

And now I wish to ask your attention to the question as to whether a children's museum should be separately housed, or whether it would find a more perfect development under the same roof, but as a distinct department of a larger museum. Our own experience has led us to

recognize distinct advantages in a separate plant. In all work with children, especially young children, the personality of the teacher, is the first consideration, and upon this depends the attitude the child will take toward the subjects presented. If he loves his teacher, who in turn understands him, he eventually associates his tasks with pleasure. Though the task in itself may not be attractive, the conscious effort with the expectation of achievement, under the guidance of a congenial and sympathetic teacher who has confidence in the child, becomes a genuine pleasure. In other words, what the teacher can do for the child depends, to a large degree upon the mutual regard between that teacher and child. It is equally true that what an institution can do for children at large depends upon the mutual attitude of each toward the other. We have reason to maintain that a museum can do the greatest good and furnish the most effective help to the boys and girls who love it as an institution, who take pride in its work for them and with them, and who delight in their association with it.

To inspire children with this love for and pride in the institution, they must feel that it was created, and now exists for them, and that in all of its plans, it puts the child first. The child must feel that the whole plant is for him; that the best is offered him because of faith in his power to use it, that he has access to all departments, and that he is always a welcome visitor and never an intruder. With this assurance he will learn to care for the museum as he cares for good friends elsewhere.

Those who would incorporate the children's museum into the large museum advocate it for reasons of economy, maintaining that it is cheaper to conduct a department under the main roof, than to carry on a separate plant. The output of dollars and cents would be less in all probability, but I often wonder whether the return to the child would not also be less. Would the child get as much attention, would his good be so earnestly sought, and would his interests be so jealously guarded? As a rule cheap educational methods do not pay.

Another reason for favoring the union of the large museum with the children's museum, frequently given, is that the children's department would have all the resources of the large museum to draw upon, the large museum possessing collections of such extent and value as no children's museum could afford to own. Children in classes could be taken to the large collections, and special exhibits could be made up in the main museum and loaned to the children's department as needed.

In a large museum it is almost inevitable that the children's interests would become matters of secondary consideration. Certain depart-

ments would be closed to children at times, and others would be opened only under proper restrictions, and the extent to which the children's department could draw upon the resources of the large museum would be limited in many ways. The value of a museum to children lies not so much in the vast array of specimens available, as in the judicious selection and arrangement of specimens which the children can understand and use. The multiplication of specimens would confuse and tire a child before he could profit from them. The proposition to marshal children by classes through vast and formal halls of a large museum present difficulties because the effect of such a trip is fatigue of body, mind, and soul, while the second effect is confusion at a mass of exhibits beyond their comprehension.

Far better for the children would be their own plan, speaking through its architectural appropriateness its welcome to the boys and girls, silently expressing to them, through its arrangement and decoration, its civilizing purposes and answering quests for knowledge through the wisely chosen selection of type specimens, so clearly arranged that children can understand and easily relate them. In this way, the children's museum becomes an educational and moral force, strengthening the child where he is weak, training him in the proper use of a museum and fitting him for the fuller enjoyment of the large museum in his maturer years.

Mr. Charles R. Toothaker (*The Philadelphia Museums*).—"I enjoyed Miss Gallup's paper very much and I have not the least intention of disagreeing with what she said. At the same time I think our experience in Philadelphia will be interesting in this connection. Our work is not the same as Miss Gallup's. We are not covering the same field, so that what we do does not necessarily compare exactly with what they have been doing in Brooklyn. There are, however, a number of points in which our experience seems to be a little bit different from theirs.

"For instance, our museum was not designed as a children's museum, but within a few years past the children of Philadelphia have been coming to the museum in very large numbers, and we have been giving lectures and we have not found any sentiment on the part of the teachers, at any rate, nor have we heard remarks by the children which would lead us to think that it would be of any advantage to us or to the children to separate our exhibits into two departments. The same exhibits which are useful for other purposes are being used today with classes of children who visit the museum and though they might very easily be

confusing on account of their great size, they do not seem to be so, probably on account of the fact that we divide the children into small groups, seldom more than fifteen in a group, and take them about the exhibits under the care of one of our own men. Then, too, they usually come to us to study some particular country, after being prepared by their own teachers in the schoolrooms before coming to the museum.

"When they come they go first to the lecture room and we try to discuss in a lecture the points which the teacher believes we can cover better than she can. We have consulted with the teachers a great deal in regard to this matter, and have eliminated such things as the teachers have told us they could handle satisfactorily, and then we have put in as much time as possible, depending on the age of the children, on the things that the teachers tell us we can do better than they can. Then when these small groups leave the lecture room and go through the museum, if they have been studying the Philippine Islands, for instance, we do not take them into the Japanese exhibit or any other exhibit, but only to the Philippine exhibit. If it is necessary to pass through other exhibition rooms, we do so as rapidly as possible. We show them the different exhibits in the cases, and their teachers are there also to instruct them, and by the time they have spent an hour or an hour and a half they are ready to go home, and they go out without really having seen anything of the museum except that one exhibit. We find this method is of value to the museum because it brings back these children with their parents to go through the whole institution.

"The visits of the children to the Philadelphia Museums are conducted in such a way that there is no confusion about their coming, and really there could not be because we are not in a position to accommodate more than a certain number. We can take care of perhaps 12,000 children a year, and we do not wish more than we have the facilities to handle. At present, therefore, we are not asking the school boards of Philadelphia to send their children. The principals of the schools make arrangements with us and the teachers bring the classes at the times appointed. Our calendar is usually full for six weeks in advance. I am often called up on the telephone by a superintendent who wants to bring a class to the museum, and he says 'Can I bring them next week?' and is very much disappointed to find that the next date on our calendar is about two months distant. I find that many of the principals are holding out a prospect of a visit to the Philadelphia Museums as a reward for good conduct. The best behaved classes are the ones that are allowed to come to the museum, and it has on many occasions happened that a

teacher from one school would tell the pupils of another school about the visits to the museum, and then the teacher from that school would call me up on the 'phone and say that she would like to send a class to the museum. Within twenty-four hours after that class had been there that teacher would call up and say, 'I cannot keep school. These children that have been to the museum have been telling the rest of the children about it and I want five more dates.' That is the method we have adopted, and we are getting about as much of that kind of work today as we can take care of.

"We have no special force to handle this work and it is attended to by our scientific department. In a way, it seriously interferes with our work, but we look on the whole matter as a part of our service to the public. We try to serve the public in as many ways as we can and when we find anything in which our museum can be of use to the public, we try to do as much as possible to fulfill the work we see in front of us."

Mr. Henry L. Ward (*Milwaukee Public Museum*).—"I was very much interested in the point that Miss Gallup brought out. I do not think any museum has any great difficulty in getting the children to attend. In Milwaukee we are handling about a thousand children a week. We have all we need and we are doing a good deal for them, but that is not the question. The question is, whether we could do more for them if we were able to handle them in a different way.

"For some six or eight years I have been very much interested in following as closely as I have been able to the work of the Children's Museum in Brooklyn, and it seems to me that there are certain features there that are unattainable by the general museum; that the psychological influence of something belonging to the child is not a thing to be ignored. The teachers in Milwaukee, as far as I know, have never brought up that question, but my experience is that the teachers are not psychologists. The question has come to me a great many times, but under present conditions there is no possibility for some years at least of our being able to handle the work as it is done in Brooklyn. Were the possibility to present itself, I feel very confident that I would very quickly decide to establish a separate museum.

"The effect of a large collection in a museum which is primarily arranged for adults, must be confusing to the child. We tried our best to get hold of the child's idea of our museum, and I find very frequently when I can get down to the expression of the child's idea that there is a good deal of confusion there. A great deal has gone over his head entirely, stunned him, as it were; he has not grasped it and that cannot but be a bad feature.

"In our handling of classes we have attempted to give just as nearly as possible what we thought the scholars ought to have. Our museum, however, has not been arranged to follow school curriculums and the result is that when the child comes from the lecture to the museum he must go to this point and that point to see the things touched upon by the lecturer, and to do that he has to visit sometimes hundreds of other cases. At the same time you cannot blindfold him; he must get these other things mixed in with what he has heard in the lecture room, and I have often wished that it were practical to take all the exhibits pertaining to a lecture that is going to run for some little time and put them in a room by themselves, apart from the rest of the museum. I think they would get a little more benefit if such a thing were practicable, but it is not practicable in a large museum. Whereas, in the museum that has been designed strictly for the child, while we may not be able to do that in every instance, we will come very much nearer the ideal."

Mr. Roy W. Miner (*American Museum of Natural History, N. Y.*).—"There is one point, it seems to me, in which the desirability of a children's museum can be very forcibly shown, which has not yet been brought out. We have no children's museum in New York. I think it would be a very good plan to have one, but the point is that when the children in New York come to our museum we place the exhibits in such a position that they can readily be seen by the children, and not only that, but we place the labels in such a position that a child of average stature can readily read them. Ordinarily in our institution the label is placed at the height of an ordinary man, and in that respect, at least, I think that a museum for children is absolutely a necessity."

A short recess was here taken, to allow the members to witness the methods of taxidermy adopted by Mr. Akeley, as demonstrated by him.

The Association having reassembled, the proceedings were continued as follows:

President French.—"At the moment when we took our recess Mr. Baker had risen to speak about Miss Gallup's paper.

Mr. Frank C. Baker (*Academy of Sciences, Chicago*).—"I simply want to suggest that, while in this great city we have children's playgrounds and so many things for children, there are no children's museums and it occurred to me that this paper might lead some institution in Chicago to think seriously of establishing one. If the Academy of Sciences had the funds to do it, we would tackle the proposition immediately. Personally I think few museum men realize the importance of taking care of the

children. We forget, possibly, that the children are the future trustees of museums and it is wise from very many points of view to educate them beforehand in order that we may use them afterwards. (*Laughter.*)

Mr. F. A. Lucas (*Brooklyn Institute Museums*).—"I have discussed this matter informally with Miss Gallup, and I am one of those who take the ground that it would be an advantage if the children's museum could be a department of the larger museum. Mr. Ward did not treat it from quite that point of view. It seems to me the better condition would be to have a distinct children's department, with its own lecture room, its own library and its own entrance that the children would come to just the same as if they had their own museum. This would simplify the question very much.

"I am, however, entirely agreed with Miss Gallup that we should not measure this thing by dollars and cents, but by the effect that may be secured. The matter of a few dollars more or less does not matter, if we get the effect we are striving for.

"The association of the two would be beneficial to the Children's Department, as we might call it, in this way: There is a large attendance of children and sometimes a thousand come at one time when the children's lecture room will only hold two hundred. Those thousand children could be turned at once into the lecture room of the large institution and could all be talked to at once. Then too, the resources of a large museum could be drawn upon. For example, if you were dealing with South America and wished to show the characteristic animals, a case could be set aside in which could be displayed for a month the characteristic animals of South America. I think all museum men will agree with me that it is quite out of the question to duplicate specimens to the extent of providing for a children's museum all the specimens that it would be desirable to show them. I would not turn the children loose in a big museum any more than I could help, even accompanied by their teacher, because the average teacher, until she has had training is unfitted to take children through the museum. To visit the museum and wander through it is possibly a good thing, but to visit it with a purpose is a far better thing, and the average teacher does not come with any particular idea except that she is going to show the museum in as short a time as possible.

"In the point of being able to accommodate a larger number of pupils and a larger number of teachers, and in being able to provide the children with temporary and very instructive specimens, it would be very advantageous to have a children's department in a large museum, and we

have the precedent for this, as Mr. Putnam was saying, in the children's department in a library."

Dr. W. P. Wilson (*Philadelphia Museums*).—"I visited Miss Gallup's museum during the past year and it is one of the most charming places I was ever in. I received a great deal of inspiration there and went home determined to see whether I could not inaugurate a museum in certain lines for children, where they could get something out of it themselves. I learned a great deal in this museum myself by just walking through it. I had never been in a room that was devoted to wireless telegraphy. I found a complete apparatus in Miss Gallup's children's museum, which the high school boys had set up, and with which they were taking the messages of ships that came in and out of New York Harbor. They had a book in which they had recorded dozens and dozens of messages, and sometimes they sent back a message. There were some very funny warnings which our ships in the navy had sent out, to look out for the boys in Brooklyn who were taking the messages. (*Laughter.*) It was a very interesting and instructive exhibit. I learned more about wireless telegraphy during that half-hour in this room than I had ever known before. I had nothing in my mind but commendation. The labels were written clearly and beautifully for the children, and the whole atmosphere of the place was perfectly delightful, except that the building was small and the children's surroundings rather cramped.

"Now, for Chicago I want to say just a word. I have been wonderfully instructed here. I came a day early on purpose to visit the playgrounds that had been established here and which excell anything else in the United States so far as I know. It struck me that in these playgrounds, where you are reaching the very elements that you want to reach, turning these children away from crime and giving them an opportunity to exercise their activities in the right way, that something might be done in the way of instruction which would be perfectly delightful. I presume it has been thought of and is in hand now and will probably be carried out, but I have seen the most interesting and instructive opportunities for children here in Chicago and in Brooklyn."

President French.—"I have not heard all the discussion, but it has struck me that there has not been a great deal said about preparing the teachers to take the pupils through the museums. That might be a good topic for discussion on some future occasion. We are endeavoring to prepare the teachers to take children through our museum. During the past year we have had more than fifteen hundred public school teachers studying regularly in our evening and Saturday classes, more

than one-fourth of all the class-room teachers in this city. We hope to get the rest of them before long."

NEXT MEETING PLACE

President French then called up the question of the selection of the next meeting place of the Association. An invitation was extended by Mr. Charles M. Kurtz, director of the Buffalo Academy of Fine Arts, on behalf of the city of Buffalo, the Chamber of Commerce, the Society of Natural Science, the Albright Art Gallery, the Grosvenor Library, the Public Library, and the Buffalo Historical Society, inviting the Association to meet in Buffalo in 1910.

Dr. William P. Wilson, director of the Philadelphia Museums, extended an invitation to meet in 1909 in Philadelphia.

On motion of Mr. Baker, Dr. Wilson's invitation was unanimously accepted, and Philadelphia selected as the meeting place in 1909. On motion of Mr. Skiff, Mr. Kurtz's invitation to hold the 1910 sessions in Buffalo was also accepted, and the date of holding the convention was, on motion of Mr. Skiff, referred to the council.

President French.—"The reading of papers will now be resumed, the next paper on the list being that presented by Mr. Henry L. Ward, director of the Milwaukee Public Museum."

SOME PRINCIPLES OF MUSEUM ARCHITECTURE AND ASSOCIATED DETAILS

During the past year I have given considerable attention to the planning of an addition to the building jointly occupied by the Public Museum and the Public Library of Milwaukee. This addition, which will lack only about one-tenth of being as large as the present edifice, is to be solely for the extension of the museum; but as it will join the present building at both extremities and one side of its L shape will form part of the façade, various architectural features, as style of exterior finish, height of rooms, etc., are definitely determined *à priori* while others must at least be brought into harmony with existing and connecting portions of the building. This new section will extend 235 feet from the northern end of a west wing through the middle of the block east to the street to what will be the northeast corner of a quadrangle and thence south 107 feet to join the end of a present shorter east wing.

The land slopes sharply down to the N. E. corner so as to afford a basement twenty-five feet in height which it is proposed to utilize as a lecture hall.

The present building is three stories in height and was constructed with the idea that a museum should consist only of exhibition halls, a suite of offices and a library room. The department of taxidermy, which is the only department of preparation as yet at all adequately organized, is located in the basement, the ceiling of which is but a few feet above the ground level. In order to provide suitable quarters for the taxidermists and other preparators, many of whom are still to be added to the force, to bring the administration in close contact with these and to provide adequate storage and study facilities, I have planned to build an additional story on the north member of the completed quadrangle, but to stop this extra story thirty feet short of the east and west faces of the building so that it will not show from the adjoining streets and can only be seen from the rear or from a distance.

Having determined on these general features there have been a host of details to be considered and concerning many of them I am free to confess I do not feel altogether assured that I have the right solution in mind. Inasmuch as the main features of style of architecture and height of new halls has been fixed by those existing and which these must join, and as the ground plan has also been largely determined by the available space on which to build, it has been out of the question to approach the subject, as recommended by Dr. Meyer, by building the halls about predetermined case units and so I have resigned myself to the unidealistic but practical frame of mind of taking what I can get. Even with these curtailments of volition there are various important matters to fight out with the architects.

It is my opinion that when an architect secures the contract for preparing plans and specifications for a large public building he too frequently concerns himself less with the uses to which the building is to be put than he does with the opportunity to create an architectural monument for himself and that, in this conscious or subconscious determination, utilities are kept subordinate to adornment. Only by such an hypothesis can I account for loading a presumably fire-proof building with thousands of feet of combustible wood made into wainscots, massive window frames, heavy base boards and redundant doors; or the paneling of ceilings with heavy complicated plaster mouldings as has been done in Milwaukee.

I believe that since youth it has been my opinion that museum build-

ings should be as nearly fire-proof as possible and to this tenet I have added that they should be beautiful only in their simplicity, so that the contained collections may give character to the rooms without the necessity of overcoming garish and inharmonious adornments. In my confession of faith it is written that I believe in beauty, but that it must be the beauty of usefulness or of appropriateness or of simplicity. Many of you will probably recall in this connection the admirable harmony secured in the Pueblo room at the Museum of the Brooklyn Institute and can conceive how difficult it would have been to have secured such an atmosphere had the room been loaded with Corinthian pillars and moldings. I do not think that appropriate ornamentation of museum rooms is out of place, for in certain characters of exhibits it may aid; as for instance in a hall devoted to Egyptian archaeology, the characters of the adornment if of that people and period might add materially in producing the atmosphere in which the collections would be most advantageously shown. But if the character of the ornamentation is purely conventional, has been introduced merely for the sake of ornamentation itself and is thus emphasized, then it must certainly strike an inharmonious note and weaken the effect of the exhibits by as much as it attracts attention. My ideal of an exhibition hall is one in which a visitor might spend hours without being conscious of anything in it except the specimens or groups. With these thoughts in mind I am striving to have our new halls left as free from woodwork and unnecessary ornamentations as possible.

In considering the division of the halls into rooms I confess to an inability to predicate what may be the future development of the institution. It has no reserved site for future additions and consequently no plan for a completed structure was ever made. Nevertheless I am going on the principle that eventually it will occupy the entire block. Were it possible to plan for this with the assurance that, when needed, additional portions of the building would be forthcoming then it would be easier to settle on permanent divisions. My present idea is to make most of these exhibition halls entirely open and then add division walls of hollow tile or of expanded metal and adamant as temporary structures which can be removed and reconstructed elsewhere when desirable.

My belief is that all exhibits of a kind should be brought together and separated by some opaque barrier from those of any other class: that an exhibit of Coelenterates, for example, is better to be in a room by itself than to share it with Porifera or with Echinodermata. The ordinary visitor is slow to notice the line of demarcation separating one group

from another and so is prone to apply to one that which a label has taught him pertaining to another. My observations of visitors to our present large rooms, two of which contain many classes of objects, is that they become hopelessly mixed with going from specimens of one class to those of another and then back to the first without seeing anyone in its entirety at one time. If we can emphasize this transition by a physical barrier we can more effectually concentrate attention and have group labels for classes, orders, etc., applied only to those forms for which they were intended. It will not be practicable, probably, to carry out this idea completely because of the small extent of some of the collections and very likely some separations will have to be made by case arrangement rather than by distinct rooms.

Although I have to say it to the architect, and to my sorrow and expense have had to correct some of the present building's shortcomings in this respect, there is little need to say to museum people that doorways must be made large enough to admit of the ready shifting of cases or of the introduction or removal of the largest specimens that it may be desirable to place in any room.

In our present building the rotunda and adjacent hallways are floored with mosaic, much of it in intricate, many colored patterns. This has a most exasperating habit of developing ugly cracks and coming loose. I am inclined to think that this common fault of such floors is due to the attempt to wed masonry to a steel frame building. The expansions and contractions must be unequal and probably account for much of the commonly observed instability of such floors. Some of our patterns would cost well up into the thousands of dollars to relay. Last year one of the less intricate panels only $8\frac{1}{4}$ feet by $11\frac{3}{4}$ feet came loose and was relaid at a cost of a little over $600. This is too expensive for flooring whose appropriateness is at least problematical. I desire a smooth, durable, neat, inconspicuous and incombustible floor that will not come loose if heavy objects like cases are rolled over it. It should be easy to clean and should be as noiseless as practicable. I would like to know what has been the experience of different museums with different kinds of floors.

The long arm of our addition will lie east and west, consequently giving a south exposure on the enclosed court. My intention is to have ground glass put into these windows in order to obviate the deleterious effects of direct sunlight upon the exhibits or the necessity of having the shades drawn for a considerable part of the day.

Milwaukee is not a smokeless city. Soft coal is burned under most

boilers and many of the chimneys near the museum emit much black smoke so that it is impracticable to use the surrounding air directly for ventilation. The present building has a system for purifying the air by washing. It is then passed by large fans into a chamber where it is heated by steam coils to the desired degree and by means of the fan pressure is forced through ducts that open near the ceilings into the various rooms. It is supposed to maintain about a half-ounce pressure in these rooms which will cause the lower strata to ascend outlet ducts running from near the floors up to the roof. Notwithstanding the fact that two fans, respectively ten and twelve feet in diamcter, are working at a considerable velocity the ventilation is not very satisfactory. The system seems to have been based on the false premise that each room would be a unit, closed to the outer air, a condition not practicable nor desirable to maintain. With doors and, not infrequently, some windows open the air finds other exits than those provided for this purpose and even where some smaller rooms are closed it seems that the air forced into these makes a circuit to the outlet without displacing a considerable part of that contained in the room. Were it practicable to have numerous inlets in various parts of the rooms and remove the air by suction I believe that better results would obtain. I have recently had a ventilating shaft constructed at the upper end of which is a four foot disc fan run by a 5 horse-power motor. This is capable of removing 13,000 cubic feet of air per minute and affords very satisfactory ventilation for the three small rooms with which it is connected.

In this matter of ventilation I have not been satisfied as to whether it were better to exhaust the air from near the floor or near the ceiling and so in two of these rooms I have caused outlets to be cut in both positions but have not yet had opportunity to determine whether the upper or the lower ones give the better results.

There is one feature of our ventilation which I do not think was considered at the time of the installation of the system but which has appealed to me as a rather valuable one for a museum. I refer to the fact that our air, even in the coldest weather when the most heat is used, has a fair degree of humidity. It does not contain as much moisture as it does in summer time when it is only washed and not heated; but it certainly contains much more than would be the case were the heating by direct radiation. Such a condition is not only more healthful and pleasant for the people within the building, but also better conserves most of the specimens and the cases containing them which are of wood.

The lecture hall that we will build in the basement will seat upwards

of 700 persons. The satisfactory ventilation of this room will be a very important matter and I would like information as to satisfactory methods installed in similar halls in other museums.

It may be of interest to note that our architects have evolved a method of leaving this lecture hall, which will be about 90 x 70 feet, free from columns and its ceiling from heavy trusses by supporting the floor above by means of trusses coming down from the side walls and holding up the floor. This of course will necessitate partition walls where these trusses will occur in order to cover them.

In the offices and work rooms I have planned to secure as complete fire proof construction as practicable, eliminating all possible woodwork, even to the extent of using metal doors and door casings.

Convenient transportation of large objects will be secured by installing a freight elevator of the dimensions of that in the Carnegie Museum, i. e., 9 x 16 feet.

Cleanliness will be facilitated by the use of the vacuum system of cleaning by which dirt will be sucked through pipes into a receptacle in the basement.

Were we to adopt a theoretically scientific arrangement of the contents of the museum we would have to begin with that which is extraneous to the earth, meteorites, then follow with geology and end with man. But adopting Huxley's idea that it is better to go from the known to the unknown and as most museum visitors know least of the inorganic kingdom and of the lower forms of the organic, we propose to start with man, devoting the entire first floor of the building to anthropology, which will be followed by mammalogy, ornithology, etc., down the line but up the several stories.

You may have noticed that I have planned to put all the offices on the top floor. There would be certain advantages in having the rooms of the various department curators on the same floors that their respective exhibits will occupy, but the planning of the building seems hardly to admit of this and I am inclined to think that the advantage of keeping all department heads in close touch, one with another, and forming a sort of cabinet to the director will not unlikely be of even greater value.

President French.—"Mr. Ward's paper is open for discussion if it be the will of the Association. If not, we will ask Mr. Lucas to give us the paper which he had modestly put down behind the others when he was in the chair, because I know there are several persons who desire particularly to hear this discussion on lectures."

DISCUSSION—DO MUSEUM LECTURES PAY?

Mr. Frederick A. Lucas, Curator-in-Chief of the Museums of the Brooklyn Institute of Arts and Sciences, opened the discussion as follows:

"My subject is, Do Museum Lectures Pay? and I wish to confess that this is not a set paper but a subject I am bringing up for discussion in the hope that I may get either affirmation of my own views, or encouragement that I am wrong.

"For the last year or two I have been led to question very strongly the utility of the average museum lecture and to query whether or not the same amount of time, energy, and money put into museum exhibits would not do more good. Let me say that I live in the most be-lectured city in the country, and I am perhaps somewhat biased in my views, but when I see the best lecturers drawing an audience of from fifty to one hundred and fifty, and good lecturers an audience of from fifty to one hundred, I am led to question the utility of those lectures. The lecture must appeal to a limited audience. The museum exhibit accompanied by a label appeals to an audience of thousands. The time put into a museum lecture would write a hundred museum labels. The amount of trouble taken in preparing the lantern slides would prepare one or two good exhibits.

"That, I think, is about all I have to say at this time. As I stated in the beginning, this is brought forward rather in the hope of discussion, than to state any pronounced views of my own."

Secretary Rea.—"It has been my experience that I reach entirely different classes by my lectures and by my exhibits. Some of the people who come to the lectures never come to the museum at other times, and for that reason in my plan for the new building I have placed the lecture room at the farther end of the main exhibition hall in order that those who come to lectures and never come at other times might gain some information as to what the museum contains. As for the school children, they will almost always take a lecture in preference to a trip around the museum with their teacher or a museum guide, if given the choice."

Mr. Lucas.—"I would like to say that I would make a decided exception in regard to lectures for children. I quite agree with Mr. Rea and with Miss Gallup that the lecture does appeal to children, and you can get directly in touch with the children there and suggest to them the value and utility of the exhibits."

Mr. E. E. Blackman (*State Historical Society, Lincoln, Neb.*).—"My experience in the West is this: we have doubled the number and value

of the exhibits in our museum wholly through popular lantern slide lectures throughout the state. A lecture without a lantern nowadays is not worth considering. We find it absolutely essential to carry a lantern for our lectures. I stand in favor of lectures throughout the state so far as the historical society museums are concerned."

Mr. A. H. Griffith (*Detroit Museum of Art*).—"I have some hesitancy about talking in regard to lectures, for I do nothing else and I believe they pay. (*Laughter.*) They pay in the results they bring to the museum. Let me say to you, Mr. Lucas, that all lectures do not pay either by the intelligence they give or by the dollars they take away from the pocket. We have a great many popular lectures in Detroit, in the museum, in the historical society, and in the art institute. The great difficulty with most lecturers is that they are over the heads of their audience. I will give you one evidence of that which to my mind is a striking example.

"I was not very well a couple of years ago and I asked a gentleman who is one of the best experts on coins in this country, and whose father was an expert before him, and who has a magnificent collection, one whom you would all know if I mentioned his name, to come and give a talk on coins. He said he would be glad to do so. Well, the first thing he did was to bring 200 coins, 175 too many. It is like going to a great big banquet and coming home with a headache—you cannot grasp it. Then he got up and talked for an hour and a half on the technical side of coins and collections, and there were possibly ten collectors, young men and boys, out of a thousand people in his audience. I said to him going home that night, 'Your lecture was a failure. It is like what the old Scotchman said to me up at Battle Creek when I gave a lecture on Scotland, "It is nae gude." "Why?" "You never mentioned my town once."' I found his town was a settlement of a dozen houses up in the mountains, but the lecture was 'nae gude.'

"Now this man told very few things that would catch the popular crowd yet he was not talking to a lot of students but to people who came there to be educated and entertained at the same time. So I said to him: 'I don't know anything about coins; I never gave them any thought nor study except in getting them into my pocket and spending them again. May I come up to your house and talk to you five or six evenings and ask you questions? I am going to give a talk on coins.' 'Why,' he said, 'come ahead.'

"I went up there and spent four or five evenings with him until twelve o'clock. He was a marvelously entertaining talker when you asked

him questions and drew him out, but you had to take hold of him just like a sponge and squeeze him to find out what you wanted to know. Then I picked up some books and said, 'Will you loan me twenty-five coins?' 'Yes.' I did not take the coins that he looked upon as being most interesting, but I took the coins that I thought would appeal to the people. I delivered that lecture and I have delivered it at least twenty times since and every time to a full house. I began by taking a coin out of my pocket because I wanted to attract the interest of the crowd and I asked them if they ever noticed that the stars on one of our coins were six pointed, and on our flag were five pointed, and would they tell me why.

"Every man in that whole crowd immediately took out a coin and began looking at it. I had my crowd with me then and I went on telling them such things as the romance of some coin, or describing the smallest copper coin ever issued. When Queen Victoria went on the throne the people were very poor; they had to take their clothes to the pawn shop until Saturday night and take them out for Sunday in order to go to church. She found that with the half-penny the bulk of the money went to the money-lender, and so she issued a coin making thirty-two for an English penny, or about one-sixteenth of our cent, and those coins were so little the people wouldn't use them. They were lost and you only find them now and then in a collection.

"Alongside of that coin I put one issued by Denmark when it wanted to put in its coins the actual value in copper, six dollars of copper in a big square half an inch thick. There was your object lesson. I could have talked to those people for two hours.

"Your lecturer fails because he imagines he is talking to a lot of students when there is only a real student here and there, though they are all students in the broader and wider sense. The lectures have made the Detroit Museum. While you may say that it is a little museum in the backwoods, still it has done something, and it has done it through lectures.

"It is generally conceded that seventy-five per cent of all the intelligence of the world comes through the eyes, and twenty-five per cent through the ears, but if you can combine the eyes with the ears you can get one hundred per cent. So we use pictures, we use everything we can get our hands on and we use words, too, at the same time, and I believe that a museum owes to its people, to its patrons, and to its visitors all the intelligence on every subject of human interest and human endeavor that it can give, and is not fulfilling its purpose if it does not give that intelligence.

"I say, give lectures. The difficulty with us is that we have a hall into which we crowd a thousand people and turn away two thousand, not only on weekdays but every Sunday, no matter what the weather is. We dare not give public notice of the talks we give to the pupils during the week, for if we did the pupils would not be able to get in. We have tried that and found it a failure, and so we only give notice to the pupils, without any public notice at all except what they get from their teachers. Lectures pay! They pay one hundred cents on the dollar."

Mr. Roy W. Miner (American Museum of Natural History, New York).—"I have been very much impressed with what the last speaker has just said, first, that all lectures do not pay, and then his inference that some do pay. I believe that thoroughly. I believe in the first place, that lecturers must be selected, not on account of their reputation but on account of their ability as lecturers. The lecturer must have a voice; he must have a hall in which that voice will not be lost. Again, the lecturer must have a subject which has some living interest for the people. He must have adequate means of illustrating his lecture. Illustrate it by the stereopticon by all means, if possible, and use colored slides. A colored slide will hold the attention and the eye and will excite interest where the very best uncolored slides would be passed by with scarcely a glance. A colored slide will bring out things which would never be noticed under any other circumstances. I have seen a colored slide of an ants' nest which was extremely interesting, though the ants' nest, itself, in an uncolored slide does not amount to anything in particular. Nobody will get sleepy when they can see such a slide beautifully colored, even though the color does not always concern the central theme.

"There is a lecturer in this city who has made a specialty of lecturing on Yellowstone National Park, a subject of interest to everyone, and we had him lecture at the American Museum of Natural History. He had a splendid series of colored slides, a good lecture, well prepared, and at least two hundred beautifully colored slides. His lecture was at least two hours long, with a slight recess of ten minutes. Our hall, which seats 1500 people was packed, because, I think, the subject was of general interest and also because it was announced that the lecture would be illustrated with beautifully colored slides. You could have heard a pin drop during the entire time, and after that lecture I did not hear one expression of weariness because of its length.

"Again, a famous lecturer came to our museum to lecture upon a

scientific subject, which was one also of popular interest. The subject attracted a large audience, but the lecturer's voice was weak, and could not reach the audience, and although his subject was an extremely interesting one, I am sure he did not look at it from the point of view of those who heard him, and therefore people got up and went out before the lecture was half finished. That is the kind of thing that kills not only a lecturer but a lecture course. The next time we had a lecture many people who had come to the first lecture to be entertained and instructed, did not come again. They said, 'Oh, no, we can spend the evening to better advantage elsewhere.'

"We have a gentleman at our museum who is, I think, an example of a good lecturer. He lectures on birds, uses beautifully colored slides, field experiences, and has a splended voice and interesting manner. Every time that man is on the program he draws a crowded house. Now New York is a place that is filled with as many distractions as it is possible to get together in one place and people are not going to come to lectures unless they expect to be entertained by them.

"When Peary lectured in the American Museum of Natural History we announced the fact by a small card in the newspapers and by invitations to members. A few circulars were sent out. As I said, our hall will seat 1500 people. We could perhaps, crowd two thousand people into it with the kindness of the fire department. That lecture was held in the afternoon. How many people do you think came to it? Thirty-two thousand people tried to get into that house! We had to have an orchestra on the second floor to entertain the overflow. We did get two thousand people into that hall and I think perhaps more. We have about two thousand members of the museum, who, of course, thought that they had a special mortgage on that lecture and came and who could not possibly get in. The doors had been closed about half an hour before the time set for the lecture, and they turned away disgusted. Perhaps it is a bad thing to have the lecture too successful, but I think it came out all right in this case because we had to repeat that lecture and of course it drew large crowds. It was given once for the members of the museum only and they felt happy.

"You can see from this instance that lectures are not failures in themselves, though some are failures. If the spoken discourse was a failure, why was the Roman forum crowded to its utmost capacity, not by those who came to hear lectures illustrated by lantern slides, but who came merely to hear men who could talk on living subjects that met the hearts of the people, that made the people themselves feel as though they would

like to get up and shout out every sentiment the man uttered. It was because a man lectured to them, who was brought up from his early youth to know how to lecture and not merely to magnify his own name. Of course, his name was magnified at the same time and we still speak that name today. The lecture cannot be a failure if the lecturer is selected, because he is a good lecturer, and I think that an intelligent man, a man capable of grasping intelligently subjects even of the complex character which are agitating the scientific world today, can interpret the most complicated scientific problem to a crowded house at any time during the present day, but he must be chosen on account of his ability."

Mr. F. C. Baker (*Academy of Sciences, Chicago*).—"I concur very heartily in what the last two speakers have said. At the Academy of Sciences we have carried on lectures nearly 14 years. We give about 35 or 40 of them every year on Friday nights. We have found that if we have a lecturer, who, as the last speaker has said, 'reaches the people,' that we can always have a crowded hall. We have found further that one lecturer who does not present his lecture in a concrete manner so that the people will understand it, will ruin the whole lecture course. I have had courses in which, say, five lectures out of the seven were splendid and the two which were not would spoil the other five, particularly if they came first.

"I have had the same misgivings that Mr. Lucas has had and I have asked myself the same qustions. I have been doing this during the last two or three weeks, because I consider our last lecture course a failure. But, taking the average of all the courses we have had, and looking at it from all standpoints and particularly after analyzing the reasons for the failures, I have felt that perhaps the responsibility rested upon me, for the reason that I was not careful enough in choosing those lecturers who could present a subject in a manner interesting to the audience. That is the great point. I think we must have lectures. As I look at it now, I do not think that I would attempt to discontinue our lectures.

"I can think of at least forty people who have come to those lectures regularly, week after week, and if a lecture course is delayed for two or three weeks, they come to me and ask me why it has been delayed, and if I am going to give them up. On one or two occasions I have suggested that we might have to give them up, and they have said, 'Don't do that. The giving of those lectures entirely free of charge is one of the best things we have on the North Side.' I think that the most important thing we have to look at is the careful selection of the lecturer."

Mr. A. R. Crook (*Illinois State Museum of Natural History*).—"For

two years we have been having lectures at Springfield and they are most successful, never less than 400 and sometimes 700 in attendance. From the crowds that attended we felt that the lectures were a success and that the audience also considered them a success. Possibly the difference is in the matter of advertising. There are three points to be considered; first, the hall; second, the man who knows how to talk; and third, the man who knows how to let the people know of the lecture and get them there.

"Our method is to send out a little notice to the families in our town, possibly a thousand or two thousand cards, telling them of the lecture course. We have found that method very satisfactory."

Mr. L. L. Dyche (*State University, Lawrence, Kansas*).—"Being a lecturer myself, I do not know whether I ought to have anything to suggest to you or not, but what do people go to lectures for, anyway? During the past twelve years I have delivered something like four hundred lectures, and I never went anywhere to deliver a lecture unless I was invited, so that the people were responsible. I have wondered myself why they came to hear a lecture and, as I walked about, thinking over what the lecture would be, I have decided first that the people must be to a very considerable extent amused. They must be entertained, and if they are neither amused nor entertained the lecture is a failure. Second, instruction must be worked in as best it can."

Secretary Rea.—"If I may trespass on this discussion once more for a moment, I think that there are two things that are sometimes neglected in considering the factors which contribute to the success of a lecture. One is good ventilation. I have seen people go to sleep as though they were chloroformed, simply because there was not proper ventilation. I have also seen people get sleepy and rub their eyes because the electric lights were shining in their faces. I think those two factors alone are the cause of many failures."

Miss Delia Isabel Griffin (*Fairbanks Museum of Science, St. Johnsbury, Vermont*).—"In the backwoods of Vermont we have found lectures very successful and even with the small amount of money which we have, and our small museum, we do not hesitate to get good men from other museums to come up and give us lectures several times a year. When we have arranged for what we consider a small lecture, say 250, it frequently happens that we will have 500 in the audience, or 700 when we have arranged for 500. We believe emphatically that lectures pay."

Dr. W. P. Wilson (*Philadelphia Museums*).—"I heard the word 'Sunday' used by one of the gentlemen who were talking about lectures. I

would like to ask if anyone could lecture here in the West on Sunday."

Mr. Griffith.—"I will be very glad to answer that question. When I opened the museum on Sunday, every pulpit in the city of Detroit berated me. I did not pay any attention, but opened the museum, and I thought the people would wake up to the fact by and by that it was all right. Later by an accident I began a series of Sunday talks. I did not expect to carry them on, but that was fifteen years ago and those Sunday talks have grown and grown until today every minister in the city of Detroit will tell you that the museum is doing more to settle the Sunday question than any other institution in the city of Detroit. The city of Detroit has built for me one auditorium at a cost of $50,000. Today they have a committee appointed by the city council to act with a committee from the museum to secure additional ground on which to build another auditorium to take care of the Sunday lectures."

Dr. Wilson.—"At what time on Sunday do you give the lectures?"

Mr. Griffith.—"I give them Sunday afternoon."

Dr. Wilson.—"I had another question to ask the gentleman, evidently from New York, who mentioned the membership in museums. I am always anxious to get hold of anything that brings in money, and I had an idea that membership in connection with a museum meant money. I would like to have an explanation of that membership of 2000."

Mr. Miner.—"We have about 2000 in our membership and that means ten dollars a year for each active member. In the American Museum, any person upon the payment of ten dollars is entitled to become an active member."

Dr. Wilson.—"What privilege does that give?"

Mr. Miner.—"The privilege of the publications sent specially to each member, special tickets also for the various lecture courses, and a special opportunity for the children of members to be conducted about the museum by a guide, a lady employed for that purpose. Formerly, when we had two pay days a week, the members with their children were allowed to enter free on those days. At present every day in the week is a free day.

"I should say also that there are other classes of members; the life member and the patron. The life member pays one hundred dollars and the patron pays a thousand dollars."

Mr. E. K. Putnam (*Academy of Sciences, Davenport, Iowa*).—"I think we are learning by experience in Davenport that while some of these lecturers talk over the heads of the people, still they are desirable

at times, and we can adapt our conditions to them by preparing for an audience of fifty people, whereas with a popular lecturer we would prepare for an audience of 500 or 1000. We have a lecture course every year, and we have not charged for admittance until the last two or three years when we have admitted our members free. These members look upon the admissions to the course as one of the principal reasons for being members, although the membership costs more than the tickets to the course. We are contemplating now going back to the absolutely free lecture course, because we lose money on it at best and we figure that we would lose less money by giving it away than by charging admission, because it would be less expensive to give.

"I would like to get more information as to whether the institutions in New York admit the public to these lectures free, or whether there is a charge for admission."

Mr. Miner.—"The lecture courses in the American Museum are given in different categories, that is to say, we have a series of lectures for members. The cards for those lectures are sent out to members only, admitting them with their friends. The public lectures are in a separate course and are advertised generally. The public is invited to attend. There is no admission of any kind charged at the American Museum."

Mr. N. H. Carpenter (Art Institute, Chicago).—"The Art Institute of Chicago has a series of lectures every winter, perhaps 30 or 40, to which only members are admitted. We have a list of members comprising in the neighborhood of 2000 or 2200 annual members, 250 governing members and 250 life members. This means that from a pure monetary standpoint the lectures pay splendidly. For every dollar that we pay out for lecturers, I think we take in ten.

"Another point that occurs to me is the statement of Mr. Lucas in regard to the amount of labor it takes to prepare a lecture, and the amount of time taken in looking up a lecturer. There are lots of people who are glad to come and deliver lecturers. Mr. Skiff said that he did not have any trouble in securing the very best lecturers here because it was sufficient inducement to the lecturer to get the opportunity to come to the Field Museum and deliver a lecture, and that is the standard we wish to adopt in the future. Then we shall be able to get all the lecturers we want."

Mr. Lucas.—"I would simply like to say that I have derived great encouragement and I suspect that, as a physician might put it, in Brooklyn we have merely a little 'local complaint.'" (*Laughter.*)

The business to come before the afternoon session being completed, on motion an adjournment was taken to meet at the Chicago Historical Society, Thursday morning, May 7, at nine o'clock, and from there to proceed by automobile to the Chicago Academy of Sciences, where the closing sessions of the conference were to be held.

SESSION OF THURSDAY, MAY 7

Morning

After inspecting the Chicago Historical Society building, the members assembled at the Chicago Academy of Sciences, at 10 o'clock A.M., President French in the chair.

President French.—"We are glad to find ourselves the guests of the Academy of Sciences, and I will at once present to you Dr. Chamberlin, president of the Academy."

Dr. Chamberlin.—"Mr. President and members of the Association; it is a very great pleasure to welcome you to the halls of the Chicago Academy of Sciences. The Academy profoundly desires to pay its respects to this Association, not only because of the Association itself and its membership, but because of the cause which it represents. The Academy participates with you in profound interest in museums and their development, and it esteems itself peculiarly fortunate that you should meet in its halls, and bring to it and to all of us something of that definite purpose which we know actuates all true museum men. The Academy desires to be serviceable to you in your great work, and it trusts that you will feel that you are in possession of its halls and if there is anything here or within our reach that will serve your purposes that you will make use of it most freely and most heartily.

"The Academy desires also to be serviceable to you in presenting in the concrete one phase of museum endeavor which is being attempted in the city of Chicago. You will, perhaps, readily recall that when you visited us before, as I trust many of you did, that Chicago spread out upon the plain so that we did not know where it reached, whether to Iowa on one side or to Canada on the other, or just where it did limit itself. You found no museum here at that time worthy of your attention or special respect. This Academy had a museum of considerable dimensions and of considerable value in its early days, but it has passed through successive fires, and whatever results it may ultimately present will have been tried by fire, though we trust we shall not be submitted to further

trials of this particular kind. With the loss of the Academy collections, with no large institution immediately within the city which had developed a collection, without public interest, you found practically nothing here. Yet we trust you have been somewhat encouraged by your recent visit in finding yourselves in concrete contact with three institutions which are endeavoring to develop an interest in museums in different forms, and this Academy in its modest way can only contribute to your entertainment in that it represents one of these endeavors, a modest endeavor, because the Academy has had its limitations as well as its complications, and yet, out of it, it seems to be emerging into its heritage.

"I think you will all agree with me that the problem of museum development is an exceedingly complex one, and that the problem of museum adaptation is perhaps even more difficult and complex than that of museums themselves. In a city constituted as this is, perhaps in any city, there is a problem of adaptation of the museum to the community, to the purposes of the community, and to the institutions which are already established in it, so that it shall reach the largest portion of the community, and shall do that portion the largest amount of good. At least, we have felt that problem very severely here in Chicago, and each of the museums of the class which is here represented has been feeling for its place, has been feeling the situation, feeling its own resources, and trying to find that situation, that line of endeavor, that mode of installation, that development of all details that will give to it its best adaptation to the community, and enable it to do that which is best in its own particular line.

"You have been fortunate enough to meet under the beautiful auspices of the Art Institute, and you have seen something of its endeavors and its great success. You have been fortunate enough to meet under the auspices of the Field Museum, and you have come in contact with its endeavors, and if you have followed those endeavors with minuteness from the time when it was instituted at the close of the World's Fair to the present, you have seen that it has been feeling for its place. It was inaugurated perhaps with a wider range of enterprise than almost any museum in the interior, and yet it has found it feasible to withdraw from relationships partially established, from certain endeavors of its own, and to find for itself a place of limitation, large as it is, and great as it promises to be.

"In this Academy it has been necessary to find still more moderate limitations, and to put itself in relationship to the community in its own particular way. There was for this Academy and for this museum the

question whether it should unite with the larger institutions of the city and give to it a concentrated museum endeavor. The majority of the members of the Academy felt that it would, in the long run, accomplish most if it kept itself in its individuality somewhat independent or aloof from the great endeavors that are taking place within the city, and so it has remained a measurably independent institution, working cordially and heartily in relationship with others, but at the same time endeavoring to find its own place and accomplish its own work.

"And so it is a pleasure for us to have you meet with us, to look into this phase and other phases of the problem, and give us such recommendations or suggestions and advice as may help us in our endeavor." (*Applause*).

President French.—"I am now certain that the association will feel entirely at home although we have been such a short time here."

Before proceeding with the reading of papers, at the suggestion of President French and on motion of Mr. Crook, the speakers in the discussion were limited to five minutes time within which to address the convention.

In response to President French's call for papers, Dr. Oliver C. Farrington, Curator of Geology, Field Museum of Natural History, Chicago, presented the following paper:

SOME PRINCIPLES OF CASE DESIGN

Museum cases are designed primarily for the exhibition of objects, secondarily for their preservation. I say primarily for exhibition, for if preservation was the chief purpose it would seem best to obtain this end by placing the objects in an iron safe. Granting, however, that exhibition is primary and preservation secondary there seems to be but one substance which can be used for the construction of cases which has properties favorable to the attainment of both. This substance is glass. If it be granted that glass possesses these properties best adapting it both for the exhibition and preservation of objects, an ideal case would seem to be one constructed wholly of glass. Glass possesses, however, certain other properties which are unfavorable, chief among which is the fact that it cannot be readily joined. It is therefore usually considered necessary in practice to place it in a framework of some substance which permits of easy joining. The conclusion seems to be obvious from our first principle, however, that this framework should subtract as little as

possible from the total glass. Two classes of substances are suitable for such frameworks; one is wood, the other metal. The relative merits of these need not here be considered in detail. Metal obviously subtracts less from the total glass, but is less easily worked and to many possesses a repellent aspect. Whichever substance is used the question of durability and economy in the variety used should be considered. Of all the metals steel probably excels in cheapness and rigidity, and hence is almost the only one that need be considered. Of the woods, hard woods obviously present less obstruction to the view than soft since they possess greater rigidity to a given amount of surface. Further it may be noted that a wood which can be employed in its natural color has the advantage of requiring less refinishing than does one which serves simply as a foundation for paint.

Having chosen as materials glass held in a rigid, attractive framework obstructing the view as little as possible, the size and shape of cases may be considered. Objects exhibited in a museum are intended to be seen by eyes of individuals of the genus *Homo*, and for the most part by individuals of this genus sufficiently intelligent and mature to read. The height of individuals of this genus possessing the qualifications referred to, varies from four to six feet; and the greatest distance at which labels printed in ten point type can easily be read in a room lighted by diffused light by the eyes of such individuals is thirty-six inches. This distance was kindly and carefully determined for me by a number of experiments by Dr. J. H. Buffum, a well-known oculist of this city. Dr. Buffum also reports the interesting fact that the distance is considerably affected by the amount of light. It may be nearly doubled if the type is read in direct daylight, but if the illumination is weak the type must be brought nearer to the eyes. The size of type which I have mentioned probably represents also about the degree of detail that a visitor would wish to observe in an object. Hence both to see most of the objects of a museum and to read its labels it is obvious that these should not be removed more than thirty-six inches from the eye. This shows that both the vertical and horizontal extent of cases lie within rather narrow limits. Vertically these limits may be said to be from eighteen inches above the floor to eighty-four inches, and horizontally not over thirty-six inches. In addition it should be noted that many objects need to be brought much nearer the eye than this, and it may be safely stated as a general rule that all objects in a case should be brought as close to the eye as possible.

Museums are housed in buildings. These buildings are usually sub-

divided into rooms or halls. A hall filled with cases of the maximum height which has been mentioned is liable to present the aspect of a forest, in which the observer "cannot see the woods for the trees." Hence therefore the mental peculiarities of the genus *Homo* must be taken into consideration. The genus *Homo* does not wish to become lost in a forest of cases any more than in any other kind of a forest. More mental satisfaction is obtained if a glance from the entrance affords a conception of the contents of a hall. Hence in the *floors* of halls cases should not rise to the full height possible, while about the walls of the halls they may do so. Considering first cases which are to be placed about the walls of a hall, it is obvious that one side is not required to be of glass. Accordingly this may be made of a cheaper and more workable substance, of which the cheapest and most workable is wood. Having made the backs of the cases of wood, such wooden backs may be utilized for the support of the objects to be exhibited. These backs should be plain and not obtrusive in any way. The nature of the support of objects upon them depends upon the nature of the objects. If they are large and light they may be hung on hooks. If small and light, or small and heavy, or large and heavy, they had best be placed on shelves. Such shelves should be as unobtrusive as possible and placed on unobtrusive supports. Moreover they should not be at a uniform height for any great distance, partly because of the monotony of effect and partly because variation in the size of the objects to be installed upon them requires different distances. The substance of the shelves may be glass, wood or metal. Glass has the advantage of being unobtrusive and of permitting light to pass through to objects beneath. It has the disadvantage of brittleness and lack of friction sufficient to hold objects in place. The respects in which glass is lacking are those in which wood excels. On the other hand, wood is opaque and in order to prevent warping and provide requisite strength must be at least $\frac{7}{8}$ of an inch in thickness. It is thus more or less obtrusive and wasteful of space. The obtrusive effect can be in part overcome by beveling the edge toward the eye. Metal can hardly be said to have any advantages for use in shelving and it has the disadvantages of both glass and wood. Whatever substance is employed, however, the shelves should be short so as to be adjustable at brief spaces. As to width, if wood is employed the width should grade from the widest at the bottom to the narrowest at the top so as to provide light, especially if the hall is lighted from above. If shelves should be unobtrusive and inconspicuous so also should be the means of support. The means of support should also be changeable within small intervals

of height and to a certain extent of length. Such changeability was secured ten or twenty years ago by the use of clumsy brackets fitted in homely slots, the effect of which was often to make brackets and slots the most conspicuous things in a case. It is to be hoped that the period of employment of this clumsy device has come to an end. Metal supports undoubtedly afford the greatest amount of strength for the least amount of substance, and steel excels among the metals in rigidity and toughness. Hence by screwing small steel brackets to small steel strips very inconspicuous supports can be obtained at frequent short distances.

Museum cases must be opened from time to time for cleaning the glass and for the removal of some objects and installation of others. The easier this process, the more likehood that the case will be kept clean and the installation up to date. The simplest means of ingress and egress to and from an enclosure is a door; moreover by swinging the door upon hinges its removal bodily at each ingress and egress may be avoided. Our first principle requires that this door shall be of glass and as large a piece of glass as is possible. Its movement upon hinges involves several difficulties, however. A slight framework cannot bear the weight of a large piece of glass if the glass in addition to its weight exerts a leverage so that the weight tends to tear the door from its hinges and at any rate cause constant sagging. Solution of the problem has been attempted by having the door slide, either vertically or laterally. Both of these devices has serious disadvantages, however. The upward sliding door requires heavy counter-weights which must be concealed in the framework, thus increasing its size, or in the rear of the case, where they are inaccessible. Moreover, large quantities of dust usually await their opportunity to enter the case whenever the door is raised. If the door is made to slide laterally on tracks, undesirable weight and mechanism are added and the area devoted to sash in front must be doubled in depth without any gain. If the doors fit loosely they admit dust; if they fit tightly they scrape against each other and often will not move at all. The solution of the problem is, I believe, to hinge the door at the top. The pull against the framework is not then seriously increased by the swinging of the glass and there is no sagging. Lights of plate glass six feet square and perhaps larger can be swung in this manner with perfect safety and when closed do not appear to be doors at all.

If our principle be accepted that it is not desirable to have cases in the central portions of a hall of full height, the question comes, how high they may be. Their lowest point can be easily determined to be such

that the objects in them can be viewed without painful dorsal and genual bendings. A height of from 18 to 30 inches from the floor may be adopted for this limit therefore. Beyond this the case may rise one, two, or three feet, but not higher, since a greater height would cut off observation of the hall as a whole. If the rise is but one foot above the base it is usual to have the top of the case parallel with the floor, thus producing what is generally known as a flat case. Such a case, however, consumes an amount of floor space equal to the amount of exhibition space, and the bending posture which the visitor is obliged to assume in order to examine its contents is wearisome. Moreover the objects are at varying distances from the eye, some near and some far away. A uniform distance from the eye could be secured by raising the height of the exhibition portion to three feet and employing a vertical installation, but in its simplest form it is obvious that such an arrangement is wasteful of space, since much of the interior of the case cannot be utilized. Some designers have thought to overcome this vacuity by combining horizontal and vertical installation in one case, *e. g.*, making the outer two feet of the case of the flat type and the inner vertical. I have not found such cases in practice especially serviceable, however, chiefly because the vertical portion of the case is too narrow and removed too far from the eye for easy observation. A case which does seem to me, however, to combine the advantages of both horizontal and vertical installation is one with sloping sides. Such cases are often known as A cases. These give for small objects the greatest amount of exhibition space to a given amount of floor space and bring the objects near the eye. The height of the exhibition portion of such cases has already been indicated to be not over three feet. Its length depends upon the size of the pieces of glass which can be readily made to swing. This length I regard as about five feet. As in the wall cases, installation in the floor cases can be accomplished by means of shelves or blocks on wooden backgrounds, adapted to the size and weight of the objects. Obviously not all material can be installed in such a case, but where suitable it seems to me advisable.

Having determined the proper dimensions of the exhibition portion of the case there remains to be decided what shall be done with the space between the exhibition portion and the ground. A frequent and perhaps the usual way of answering this question has been to place the exhibition portion of the case upon four slender legs, but for many classes of objects this support is not sufficient, and its appearance seems to have to be unsatisfactory psychologically. Moreover, I

GEOLOGICAL HALL IN THE FIELD MUSEUM OF NATURAL HISTORY, CHICAGO, ILL., SHOWING CASES CONSTRUCTED ON THE PLAN ADVOCATED BY DR. FARRINGTON.

can see no objection to utilizing this space for museum though not for exhibition purposes. I believe that it is sound practice to enclose this portion to form a solid and attractive base, the interior of which shall be fitted with drawers or trays, or left so that it can be entered for any purpose desired. I do not, however, regard it as desirable to carry this base to the floor all around, as is usually done. Anyone who will examine such cases that have been in use for several years will find them exhibiting an unsightly row of scars and discolorations for about four inches from the floor, where the toes of visitors have struck against them and the mops of janitors swashed them. Moreover, dust accumulates under such bases and cannot be removed without moving the entire case. All these difficulties may be overcome by removing this portion in the structure of the case except at four points of contact with the floor sufficiently large to give proper support. Such under-cutting has been somewhat criticised, but in practice I have never found it to have any bad features.

A considerable effort is usually made by designers of cases to prevent the entrance of dust. In fact it sometimes seems as if in the design of cases the only thing that had really been kept in mind was to prevent the entrance of dust; and as noted at the beginning, this could best be done by placing the objects in an iron safe. It also seems usually to be forgotten that most specimens will themselves in time produce more or less dust which must be removed at intervals. As a matter of fact a case built according to ordinary principles of cabinet work and by an ordinarily capable cabinet worker will usually admit less dust than would come from the specimens themselves. A simple tonguing and grooving of the movable portions of the framework and a covering of such tongues and grooves with felt will, if the workmanship of the case is good, prevent the entrance of any serious quantities of dust. The elaborate ventilating systems which are sometimes advocated I regard as generally unnecessary.

The question of the color of case interiors is an important one which may be properly considered in studying case design. White has the advantage of lighting the interior of the case. On account of such lighting, however, it does not form the most effective background, since relatively less light reaches the eye from the specimens themselves. Most white coloring matters that have been employed in the past also have a tendency to turn yellow, so that the case has become spotted after a few years. This it has been sought to obviate by employing a yellow color that is a cream at the beginning. The discoloration has, however, usually been due to the fact that a lead pigment has been employed

instead of a zinc or earth white. If these be used instead of white lead no serious change in color need occur. Black for case interiors has the advantage of absorbing all extraneous light except that from the specimens themselves. The specimens therefore stand out, as we say, more distinctly and impressively. This will be found to be true even for dark specimens, and there is no specimen which, I believe, will not stand out well upon a black background. The effect is, however, it may be noted, better obtained by the use of a "flat" than of a shiny black. One disadvantage of a black interior is that, especially when plate glass is employed, the glass becomes a mirror in which the visitor can see himself or herself if desired. The problem then presented is a purely psychological one, however, the question being whether the visitors shall study themselves or the specimens in the cases. I do not consider this a problem which the curator is called upon to solve. Between white and black various colors of the spectrum have been employed for case interiors and have been advocated from time to time more or less warmly by their adherents. Green has been urged on account of its well-known softness to the eye. Some museums are convinced that light blue or gray is the only proper color, and one great museum of this country for a time used maroon extensively. To my own mind, however, all colors have the disadvantage of setting up their own hue as a rival to that of the specimens, causing contrast and often conflict. If to the colored background be added labels of a different color, there are obtained three color effects, which are distracting, to say the least.

Having established some principles regarding the material of cases, their shape, size and color, there remains to be considered the appearance of the case itself. Shall this be made ornamental, or not? Without doubt the ornamentation of museum cases has often been carried too far, so that the case has been more impressive than the objects which it contained. On the other hand the case need not be so plain as to be ugly. Further elucidation of this problem I shall, however, leave to our members of the art section, it being one of the happy features of this Association that its membership includes those able to deal with problems from the standpoint of art as well as of science.

Mr. F. A. Lucas (*Brooklyn Institute Museum*).—"I have enjoyed this paper very much because Mr. Farrington and myself have been working along parallel lines. I quite agree with his last statement that a case has some function other than to preserve its contents, especially a large case.

It should not only frame its contents but should itself be pleasing to look at. We are trying to abolish shelves. I have two or three cases now without shelves. We are also trying to abolish mahogany cases, and if I live long enough we will have abolished almost all of them in the Brooklyn Museum.

"The color of the case is very important. I like very much the color of the oak cases in the hall above in this building, and I think that will be the color we shall adopt in our new cases. The color of the book cases will be oak, either stained dark or with a mission finish, almost black. For art cases a polished ebony is about as good as can be had, although I have found it rather funereal in the Drexel Institute.

"Another point is this, that no architect has yet designed a thoroughly satisfactory table leg. I am very much pleased with the table legs in the Art Institute here, so much so that I am going to copy them."

Mr. Henry L. Ward (Milwaukee Public Museum).—"The case problem is a very serious one for museums, and I followed with considerable interest what Dr. Farrington had been doing at the Field Museum. Some time since, I looked over the question of cases rather carefully and I think he somewhat underestimates the size of glass that can be successfully swung from above. Some four years ago I had certain cases made for the exhibition of guns. These cases were over ten feet in length, and some seven and a half feet in height, and while it was something of a problem with me as to whether I could swing such a large plate of glass successfully or not, in talking with a case builder we concluded that we had a good chance of being able to do it. We used heavy glass, an inch and three-eighths to an inch and a half in thickness, and it has worked successfully for the past four or five years, and given very good results.

"I have considered the interior color a great deal, and have come to the conclusion that black for certain objects, such as coral, and a cream color for almost everything else is very satisfactory. We are trying to do away with shelves, which seem very offensive. Dr. Farrington's idea of breaking the shelves up into very small ones is a very excellent idea, but we intend, as far as possible, to abolish shelves in such exhibits as birds. We have a style of bracket which will be practically invisible, and will enable us to mount the birds just where they will most properly come and break up the row arrangement, which certainly is very inartistic."

Mr. F. C. Baker (Academy of Sciences, Chicago).—"There is one thing that has struck me very forcibly in regard to cases while visiting other

museums during the last few years. You will see one visitor looking at a case and he will be stooped down this way and then you will see another one stretching up this way (*indicating*). Some of the labels and exhibits may be eight or nine feet high and the visitor needs a stepladder or a pair of glasses in order to study them. In other cases the exhibit is too low, and this is inconvenient and bothers a visitor very much. In my judgment we should always bear in mind in case construction and the placing of exhibits, that they should be so exhibited as to be not very much above the line of vision."

Secretary Rea.—"As I am about to build some cases, I would like to ask three things; in the first place, whether a solid baseboard with a slate kicking plate, is worth while."

Mr. Lucas.—"Yes."

Dr. Farrington.—"None at all is better."

Secretary Rea.—"How do you sweep underneath the case if you cut out under it as you describe?"

Dr. Farrington.—"By cutting out four inches it is perfectly easy to sweep under it."

Secretary Rea.—"How deep should wall cases be built where the permanent use of the case cannot be told in advance?"

Mr. Lucas.—"About 24 to 28 inches inside."

Secretary Rea.—"And if you use small specimens, bring them forward?"

Mr. Lucas.—"Yes."

Mr. Ward.—"I am up against the same proposition myself, having let a contract to a case builder for some cases just before I left Milwaukee. I might say that I design my own cases because we have too artistic an architect. I am putting certain cases in a room from which I feel confident that the entire contents will be removed. Consequently, I cannot predict just what those cases will be used for. I have made one wall case 20 inches deep and another 15 inches deep. I have made wall cases only five and a half inches in depth for certain exhibits which I knew would be permanent. My idea is that the nearer the glass can be to the background the better. Even half an inch in a case makes a lot of difference. I cannot quite find out why, but it does.

"Regarding baseboards, I am going to put Tennessee marble on the bases of my cases. I know that Doctor Farrington's cases look well, but I think that the others look better as far as coming down to the floor is concerned. At any rate, I have inherited a great lot of cases and they all come to the floor, so that I am more or less tied by precedent."

Secretary Rea.—"Does the marble stand the floor oil that is used on a wooden floor?"

Mr. Ward.—"I think not, but I have cut out the floor oil. We used to use it, and people complained that the air in the museum was very bad. This was partly due to insufficient ventilation, and partly due, I feel sure, to the oiled floor. We also had complaints every once in a while that some lady had ruined her dress by coming in contact with the oil on the floor, and so we have done away with it."

Secretary Rea.—"My third question is this: In a large hall, 150 feet long and 90 feet wide, lighted from above by skylights, would you put glass tops on the wall cases? Will there be enough light coming in from the sides to light the case, or would you put on a glass top in order to secure a diffusion of light from above?"

Mr. Ward.—"I experimented on that point. Our old cases all had glass tops, and to satisfy myself whether there was any value in them or not, I had one of my men put a board on top of one of those cases, removed perhaps 15 feet from a large side window, extending 8 or 10 feet higher than the top of the case. That board entirely shut out the light coming through the top of the case, and yet I couldn't see the slightest difference in the illumination of the back of the case, and when I had the board moved around there was no perceptible shadow following it at all, so I immediately put in the specifications that the tops of the next cases should be wood."

Mr. F. A. Lucas.—"My own experience is exactly like that of Mr. Ward and the cases we are now building have wooden tops."

After some further discussion, participated in by Messrs. Miner, Jennings, Rea, Emerson, Lucas and Farrington, the reading of papers was again resumed, Mr. Toothaker presenting the following:

FUMIGATION

The preservation of the materials placed in his care is one of the most important duties of a museum curator. He is expected to see that neither moth nor rust doth corrupt and thieves do not break through nor steal.

Specimens are of such varied character and the materials in a museum are of so many different kinds that the problem of their preservation is one that calls for many devices. Among the enemies to be combatted are insects, mice, dust, natural decay, heat, cold, and dampness.

In many instances the insect enemies are the most troublesome. Moths of various kinds attack all articles of wool; they eat skins, horns, and almost everything else of animal origin.

Both moths and weevils attack grains and seeds. The drug store beetle is an almost ever-present curse against which nothing seems proof, for he has often been known to go through tin foil to reach the object of his desire. Wood boring insects add to the curator's difficulties and not infrequently destroy valuable specimens.

To rid a museum of all these pests and then to keep them out is not easy, and in The Philadelphia Museums we have had perhaps more trouble than has been experienced in many other places.

At various times we have received material from expositions and have had shipments sent us from foreign countries. The bulk of this material has been very large and it has often in the past been difficult to handle promptly. The specimens have been of practically all kinds and have not infrequently been infested by insects when received from abroad. To add to our difficulties, many of our glass cases had been given us and, like some very cheap ones which we had built, they were not insect proof. We used naphaline in large amounts only to become convinced that while it may keep out most of the insects from material free from infestation, it will do little toward driving away those which are already present. We stored with tar paper, sprayed with turpentine, poisoned with arsenic and with corrosive sublimate solution, and resorted to all other means which are commonly supposed to make the neighborhood unpleasant to members of the insect tribe. We had a fumigating box as large as a small room. From time to time we dismantled cases, placed the specimens in the box and fumigated with bisulphide of carbon. We used this same fumigant in the few comparatively airtight cases which we at that time possessed.

Bisulphide is, however, objectionable on account of the dangerous explosive quality of the heavy gas and we always felt a hesitancy in using it in the building, knowing that some at least of our cases would leak.

About four years ago we began using hydrocyanic acid gas for fumigating and this agent seems to us to have many points of superiority over anything else we know.

1. It kills all living insects (except that it has practically no effect on wood borers, probably because it does not penetrate to them).

2. Its action is more rapid than that of either bisulphide of carbon, chloroform or any other agent we have tried.

3. It does no harm to specimens except to living plants, even when used in very strong doses.

4. Being a light gas it rises from the floor and within a few minutes thoroughly permeates all parts of a case.

5. On account of its lightness, it is easily gotten rid of and a case is safe to enter within a few minutes after the door is opened.

6. It is not explosive nor inflammable.

7. While it is dangerous to human life if breathed, its peculiar smell is quickly recognized and serves as a warning of danger.

8. Fumigation can be done thoroughly, and so quickly that there is no necessity for having dangerous gases about the Museum at a time when visitors are present.

9. The action of the gas is so rapid that even if cases be not airtight, all insects can be killed without difficulty.

10. The process is cheap.

Hydrocyanic acid gas has been used to some extent for a few years past to fumigate residences in order to kill household pests, to fumigate orchards to rid fruit trees of San José scale, and in hothouses.

When applying the gas to living plants it must be used carefully, for if the application be too strong, tender plants will be killed. In fumigating museum cases it is perfectly safe to use it in very strong form, and it is best to do so in order to make sure that it will penetrate all parts of the case, and in order to make certain of killing all insects.

Soft-bodied animals, like worms and moths, die more quickly than hard-bodied beetles, and for the latter it is especially desirable to use the gas in strong doses.

In fumigating, we place in the case, first, a deep earthern jar containing a mixture of two parts of water and one part of sulphuric acid. This should be placed near the door on a piece of board and it is safest to protect the things nearest to it by hanging up newspapers or otherwise screening the jar so that in case it bubbles vigorously the sulphuric acid will do no damage. Into this jar we then drop a piece of paper containing some coarsely ground potassium cyanide and quickly close the case. Most of the cyanide should be in lumps not over half or three quarters of an inch in diameter, and such coarse material is rather better than very fine powder since the chemical action is then not too rapid and the jar does not boil over. The amount of cyanide should of course be proportioned to the amount of acid used, this depending on the purity of both ingredients. Using sulphuric acid and cyanide of potassium (both C. P.) we employ 25 grammes of cyanide to 25 cubic centimeters of

sulphuric acid, and 50 cubic centimeters of water. This amount of material is used to every 100 cubic feet of air space.

Hydrocyanic acid gas has proved superior to other fumigants in our work in the greater speed and certainty with which it kills. We have made comparative tests with cyanide and other gases and the following statement of results will probably be of interest.

In a storage case containing 800 cubic feet of space, we had stored about 150 fleeces of wool, each in a separate muslin bag. We placed in a corner of this case a bag of wool containing several hundred live wool moths and worms which had been raised for this experiment. The case was fumigated by heating solidified formaldehyde over an alcohol lamp and we used more formaldehyde than the makers of this preparation recommended for what they claimed to be thorough disinfection and killing of all microbes. After twenty-four hours the case was aired off. The bag containing insects was opened and the contents spread out. The worms appeared to be dead, but in the course of an hour many of them were crawling about, showing that life was not really extinct.

Another case as nearly as possible the duplicate of this was prepared and another bag containing fresh worms and moths were placed in similar position. This case was treated with cyanide and the dose was made a little weaker than we ordinarily employ. After eighteen hours the case was opened and the contents of the bag was spread out in the fresh air. Not one worm or moth came back to life, although they were watched for twenty-four hours.

We have experimented with burning sulphur in cases, but this was not successful on account of a deposit of sulphur forming on the glass of the case and on account of the effect of the gas on colors and on metals.

For several years we have not used bisulphide of carbon on a large scale. Neither this agent nor chloroform seems to have great penetration. A two-quart bottle of flour containing live larvæ, closed with a ground glass stopper, was treated with fifteen drops of bisulphide, and another bottle with fifteen drops of chloroform. Twenty-four hours afterwards the bottles were emptied out and some of the larvæ were found to be still living. A similar bottle of flour containing larvæ was exposed without stopper in a storage case for twenty-four hours to the action of hydrocyanic acid gas and no live larvæ were found.

Living flies, spiders, roaches, grasshoppers, grain moths and wool moths were placed in a case containing 800 cubic feet of space, fumigated with 8 ounces of cyanide of potassium and a proportionate amount of acid. It evidently took several minutes for the gas to reach the insects

which were at the end of the case farthest from the jar. The spiders, flies and moths were all apparantly dead in five minutes from the time the case door was closed and the roaches and grasshoppers lasted not half a minute longer. The case was opened two hours later and the insects given fresh air, but none of them came to life.

Live wool moths and worms were wrapped up in a heavy blanket. After exposure for several days in a small case containing an open vessel of bisulphide a few of the worms showed signs of life. A similar test made in a case with cyanide fumigant resulted in the death of all the worms.

Since beginning to use hydrocyanic acid gas we have had practically no injury from insects, but I attribute this simply to watchfulness and fumigating at the proper time and am not ready to state that the gas does any harm to insect eggs. So far as I know these can only be killed by heat or by the direct application of some liquid such as dilute corrosive sublimate solution.

For wood-boring insects the only really effective remedy we have tried is immersion of the article in gasoline. This usually does no harm, although it injures wood to the extent that it removes some of the soluble matter, slightly changing the composition and rendering it more brittle. This of course spoils specimens for strength tests and scientific purposes, but the gasoline bath saves wooden carvings, idols and similar specimens from destruction.

Secretary Rea.—"How much time do you allow to close the case and get out of the way?"

Mr. C. R. Toothaker (*Philadelphia Museums*).—"Why, I suppose it does not take ordinarily more than five seconds to close the case and get out of the way."

Secretary Rea.—"Well, you stop to screw up half a dozen nuts, don't you?"

Mr. Toothaker.—"In a case of that kind, one man drops the little paper bag into the jar, and turns and reaches for the edge of the sash, and another man has hold of the other edge of the sash and it is pulled in place and closed within ten seconds."

Mr. Charles C. Adams (*University of Chicago*).—"I have had some experience with this fumigation in a nursery, where they build a shed large enough to drive a wagon in, and cover the trees or shrubs that are on the wagon, and treat them with this process. I think that method

could be applied to museums, where the cases could be taken into a room arranged in the way described."

Mr. Henry L. Ward (*Milwaukee Public Museum*).—"I would like to ask whether this process is deleterious to any museum material, whether it has any bad effects on metal or anything of that sort."

Dr. A. E. Ortmann (*Carnegie Museum, Pittsburg*).—"None at all. It is recommended for fumigating, by the State of Pennsylvania. It is very easy with this method to begin at the top floor of a museum and go down through the different rooms on the different floors with your little paper bag and glass jar, and there is no danger whatever."

Mr. Toothaker.—"I have not observed the slightest damage, not even a sign of tarnish or any deleterious effect on textiles of many colors."

Mr. Ward.—"In a recent edition of the Museums Kunde, there is a description of a plant in Europe for the use of bisulphide. There is a large retort into which runs a truck on rails carrying large or small objects. Then by the vacuum process the air is abstracted, and the bisulphide is introduced for the purpose of fumigation. There is also some arrangement for taking off the gas afterwards before the things are taken out."

Mr. Roy W. Miner (*American Museum of Natural History, New York*).—"In the American Museum we have a series of fireproof storerooms up under the roof. The offices are on the top floor and above that, on the slope of the roof, there is a fireproof gallery. Along that gallery is a series of fireproof vaults with fireproof doors, the sills of which are about eight inches from the gallery outside. They are entirely floored with concrete and the walls are of concrete. The doors to these vaults have a latch arrangement similar to that you often see in a butcher shop, or in a cold storage plant, which closes the door very effectively. At the upper and lower portions of the door there is a circular hole about three inches in diameter and into that hole can be introduced any fumigating substance that seems desirable. We found that that method works very satisfactorily."

Dr. W. P. Wilson (*Philadelphia Museums*).—"I have a little place where I am cultivating fruit trees of various kinds and I have found that the ordinary lime, salt and sulphur solution, which has been recommended by a great many people, does not kill the scales. I have trimmed my trees very closely in the top, so that they are not over 20 feet high, and I have constructed a tent about 10 feet wide at the top and about 25 feet high, with an opening on one side so that it can be taken up by two men and thrown right over one of these trees. It is made of heavy canvas,

dipped in hot paraffine. I find that it holds the gas perfectly and I fumigate my trees in this way with hydrocyanic acid gas and find that it is perfectly successful. It cleans absolutely every living thing off the tree and does nothing to injure it."

Before taking up the next paper, a cordial invitation was extended to the members of the Association by Mr. Henry L. Ward, director of the Public Museum of Milwaukee, to visit the city of Milwaukee and inspect its museum, and other institutions, before returning to their homes.

President French then called for the following paper, which was submitted by Mr. Robert Koehler of Minneapolis:

SOME IDEAS ON THE FOUNDING OF AN ART MUSEUM

When your president extended to me an invitation to attend your present meeting and, if possible, to read a paper or lead a discussion, I felt not only highly complimented, but also deeply grieved that I am not yet really a museum director. My first impulse therefore was to gratefully decline the invitation and then vigorously to continue my efforts to aid in the establishment of not only one, but of two art museums: one for Minneapolis, the other for the State Art Society. Whether I should ever really become the director of either may be uncertain; at all events I deem it wise to "be in training" and ready to assume the duties whenever called upon to do so.

This consideration finally induced me to accept Director French's invitation, for I could think of no better opportunity to increase what knowledge and qualifications I may possess for the office than a free discussion of ideas with practical men.

The very small beginnings towards the establishment of an art museum in Minneapolis, for which I may as well assume the greater share of responsibility, consist of a few pictures acquired primarily by way of encouraging our noted American artists to send works of high artistic value to our periodical exhibitions, which we arrange for the purpose of stimulating an art interest in our community. We fondly hope that the realization of our plan to erect an art museum building is not far distant; for the necessity becomes more apparent from year to year—nay, from month to month. The quarters allowed us in the public library building are insufficient to accomodate our art school, while the possibility of holding exhibitions depends upon the good nature of our students

who must give up some of their class rooms from time to time for this purpose.

There is no mistaking the development of a healthy art interest in our community. It has grown so rapidly within a few years, that the demand for the best and newest in art could hardly be exceeded in older communities; and still it is not long since the study of art has been elevated from a mere fad to a fundamental principle in education; and while such recognition is as yet by no means quite general, we have at least passed that danger point in our public school system where any change in the organization of the school board might threaten to eliminate or even to seriously hamper that branch of study. Indeed, the tendency is rather in the other direction; and if any radical change is ever attempted, it will be to further emphasize the importance of art study, making it more practical, more directly applicable to the needs of our every-day life.

For generations the idea has obtained almost universally that art is something apart from our needs, is a luxury for only the wealthy to indulge in, since it consisted solely in costly treasures, carefully stowed away in museums, mayhap, where you could for a cash consideration gain an occasional glimpse of rare masterpieces, of whose true value you hadn't the slighest appreciation.

As long as a severe line was drawn between the so-called "fine arts," and the art-crafts, to which latter the very term, art, was only reluctantly applied, it was perfectly natural that the study of art failed to commend itself to the public in general. Of course such a line cannot be entirely eliminated, for a distinction between the two will always exist; but we now recognize that it is rather a distinction of degrees than of kind, and that the difference between a painter and a silversmith might just as easily be in favor of the latter when the purely artistic value of their products is compared.

I am aware that even now this view is not universally accepted by our brotherhood, but it is certainly gaining ground and will undoubtedly prevail in the end. A cursory glance at conditions prevailing but fifteen years ago will help to make this clear.

Mr. Ives, director of the Art Department of the World's Columbian Exposition, had invited the craft-workers to make their work a part of the art exhibit, and the only acceptable response made was by the Rookwood Pottery of Cincinnati. This was either because the craft-workers generally hesitated to class themselves among the artists, or they doubted that full justice would be accorded them by an artists' jury of selection—or for both reasons. But eleven years later a great change

had taken place: at the World's Fair in St. Louis the broader view had triumphed, the imaginary line of demarcation between the art-craft and the fine arts had disappeared.

And this is a matter of greatest significance in the establishment of an art museum today. In the past quite generally—and with a large majority of people even now—a museum is merely a show-room, a point of attraction to the casual and the professional sightseer, visited not so much with the object of obtaining or increasing knowledge, but rather to satisfy curiosity, and, opportunity offering, to demonstrate apprecia tion of art by critical remarks.

All the old world art museums of renown are strictly classified as "art galleries" and as "museums" for the industrial arts or handicrafts. In art galleries no attempt is ever made to demonstrate the independence of the arts and the crafts; endless walls are hung with countless pictures, arranged, where feasible, in chronological order, it is true, but still mostly without the slightest regard for their original purpose, even where this had been a very definite one.

Museum directors take pride in "completing" their collection of the works of certain masters or schools and proudly hang their new acquisition on the wall, even though it had originally been designed for a ceiling. Pictures are taken from their original frames, often designed by the artists themselves, and supplied with a "more modern" setting, while the old frame goes into a junk shop where perchance it is discovered by the director of an "Industrial Arts Museum" and highly prized as a rare find.

It is not likely that European art galleries will undergo any radical change in the near future. They will remain vast store houses of pictures by the old or the new masters and will continue to constitute the chief points of interest to many thousands of travelers and students. They have well-nigh captured all of the works by the old masters that are worth having or at all obtainable, and when an American institution attempts to form a collection of old masters, it must be in the main content with inferior works, and make most of them appear as far more valuable than they really are, thus cultivating a false standard for such of our art lovers as are unable to visit the European collections.

But the scarcity of old masters need not prevent us from having fine art museums, institutions of the greatest educational value. In fact, such scarcity might be called blessed since it will compel us to arrange our museums on an entirely different plan, more readily destined to serve a practical purpose in our communities than would any necessarily weak copy of the famous old galleries of Europe.

The opinions I have arrived at may not have as much value as I fondly hope; they may not appeal to the directors of existing institutions in the older cities. But I consider them applicable in the newer communities, where the desire to have museums of their own has obtained firm footing and where the means available preclude the possibility of duplicating the Louvre or the National Gallery.

Being a firm believer in American Art, and considering its best examples as more worthy of a permanent place in public galleries than many spurious and indifferent examples of past ages that have already found their way into some of our collections, I would advocate the acquisition of the best modern and early American works obtainable; not only pictures and works of sculpture, but also the choicest examples of handicraft as well. These I should place in various rooms in such a way as to form integral parts of the general arrangement, every portion of which, from floor covering to wall paper, all furniture and all structural parts of the rooms, to be of artistic design and workmanship. There would be living rooms, libraries and dining rooms, some simple and inexpensive in their appointments, others more luxurious. There would also be larger rooms with skylights to serve as art galleries proper; but the walls would not be covered with pictures closely hung; cabinets and chests, chairs, screens and other objects would be assigned their proper places and thus continue to fill places for which they were originally destined.

Such a scheme will serve two important purposes: not only will it be to the living the most practical means of consulting a high standard for their own endeavors, but the generations following upon our own will have a reliable picture of the art of our present period without being obliged to reconstruct the same from scattered fragments.

The most vital interest of the living is in the living, or ought to be. That being satisfied or not satisfied, as the case may be, we turn to the past to see how other generations and other people in foreign countries have lived, and your museum will grow to meet the demand. The few old masters you may be able to obtain can be placed to good advantage in rooms patterned after the style of their time, with original furniture, hangings, etc., whenever possible.

One gallery I should also have where photographic and other copies of famous old masterpieces, arranged in chronological order, may be seen and examined by all who are sufficiently interested in the study of art or art history.

There should be a sculpture gallery, containing all the famous statues,

busts, reliefs, that can be obtained in good plaster reproductions—and there should be no fig leaves.

The great architectural monuments of all times and all nations should be represented by plaster or wood models, made to scale, as well as by photographs, showing their setting.

In fact, whenever originals are not available, good copies should take their place. Good old originals are becoming scarcer every day and the number of imitations in pictures, sculptures and craftwork which have found their way into private and public collections, is notoriously great. Not only our own but European museums as well have been so frequently victimized, that the museum authorities have been obliged to form a sort of protective association to guard themselves against clever swindlers. While this is not necessarily a strong argument, it may be taken for what it is worth in pleading for the preference of frank copies to doubtful originals.

A reference library I consider an indispensable adjunct of the new museum; such library to be for the convenience of the serious student and in no way detracting from the free use of a public library.

Admission to the collections of the museum should be free at all times during the day and it should also be kept open on some evenings every week.

There should also be rooms in which periodical exhibitions can be held, so as to keep constantly in touch with what is going on in the art world, and finally, such a museum should also maintain an art school, in which all the branches of art, as well as the handicrafts are taught.

And one of the most important provisions, one that would tend to produce the most practical results, is the establishment of free lecture courses, illustrated by the objects in the museum. I say advisedly "illustrated by" and not merely "descriptive of" the objects contained in the museum, since the latter would necessarily result in rather incomplete information, and consequently be of little educational value.

I believe that in this manner even a small, but good, collection can be made of far greater importance than the most elaborate cataloging or the most extensive labeling could ever be. The spoken word is of immeasurably greater value than the most erudite printed treatise can be to him who comes to see things and wishes to learn their significance.

Now the question naturally arises: Is such a plan at all feasible? That depends altogether on conditions, certainly. There is probably no community ready to set up such a museum at once. But that is not the idea. The idea is, that every community contemplating the building of

a museum should start in such a way as to make its gradual development along these lines possible, without having to discard entirely its first beginnings and make an entirely new start every decade or two.

Allow me to sketch briefly how the problem should be attacked.

I take it for granted that all the preliminary educational work, which was necessary to awaken interest and stimulate a strong desire to start the movement, has been successfully accomplished. The first requisite then becomes the selection of a proper site. All practical business men will suggest that it be "centrally located," easily accessible from all parts of town. This, however, at once implies a temporary location, an unavoidable removal as soon as the business interests of the city expand. The proper location, ideal and practical at the same time, would be in some city park of sufficient size to permit of expansion without entirely destroying the original purpose of the park as a breathing place and pleasure ground.

It goes without saying that an art museum should in itself be an artistic and monumental building when completed. But it does not follow that it should be built of the costliest material or that it should present an imposing facade before it can be allowed to serve its real purpose.

The most pressing needs may not be identical in different communities; in one place they may be found in a picture gallery, in another the housing of some important collection other than paintings, in another proper accomodation for an art school. Whatever they may be, they should be met at the outset; that is, such part or parts of the general plan specifically designed for the accommodation most urgently required should be built first, while further additions may be made whenever the necessity arises and funds become available. The beginning will therefore probably consist of a group of buildings, perhaps with temporary connections, perhaps entirely isolated (which would be less desirable). Ultimately these buildings will form parts of the entire structure as originally designed, and it would be a slow community indeed that would allow very many years to pass before bringing this about.

I know of one city at least where they refused to make a beginning about ten years ago, because the money offered them was not enough to erect a palace. The consequence was the withdrawal of the offer, and the failure to make a beginning to this day.

In another city no provision for expansion was made, and valuable gifts offered had to be declined for want of space.

If a city desires to have such an institution it should be willing to pay for its maintenance as a matter of course. In fact it is an extension of

the educational system which every city supports at present. It is more far-reaching in its effects, since it offers educational facilities to adults as well as to the children attending school; offers inspiration, not only to the artist, but to every artisan; broadens the views of every professional and business man and makes life richer for every one.

Mr. Frank C. Baker (Academy of Sciences, Chicago).—"There is one thing which appeals to me in this paper and which is exemplified in this institution. This institution is free seven days in the week, its lectures are all free and even its check room is free, all the checking for the public being done without charge. In fact, it seems to me sometimes that we have gone almost to the other extreme. It has, however, always appealed to me that a public museum, partly or wholly supported by public money, should be free."

A recess was here taken until 2:30 P.M.

Session of Thursday, May 7

Afternoon

The closing session of the Convention was called to order by President French, at 2:30 o'clock.

Secretary Rea then read the following resolutions, which were adopted by a unanimous rising vote:

RESOLUTIONS

Resolved, That the sincere thanks of the American Association of Museums are hereby tendered the trustees and officers of the Art Institute of Chicago, the Field Museum of Natural History, and the Chicago Academy of Sciences, for their generous hospitality and many courtesies tendered the visiting members.

Resolved, That the thanks of the American Association of Museums are hereby tendered the trustees and officers of the Historical Society and the Crerar Library for the courtesies extended to the members of the Association.

Resolved, That the thanks of the American Association of Museums are hereby tendered the Management of the Auditorium Hotel for courtesy in reducing rates for the members of the Association.

Resolved, That the thanks of the American Association of Museums are hereby tendered Mr. Milward Adams, Manager of the Auditorium Theater, for his courtesy in inviting the members of the Association to enjoy an evening of recreation in his theater.

Resolved, That the thanks of the American Association of Museums are hereby extended to the following persons who so courteously tendered the use of their automobiles to the Association during its Chicago meeting: Mrs. Marshall Field and Messrs. Charles L. Hutchinson, LaVerne W. Noyes, E. C. Logan, A. A. Sprague, J. J. Clessner, A. C. Bartlett, C. H. McCormick, Harold McCormick, John Farson, J. F. Foster, Charles Dickinson, Watson F. Blair, Richard T. Crane, Jr., George F. Porter, W. W. Keith, Arthur Meeker, J. J. Glessner, John Talbot, James Simpson, Kenneth Barnhart, Stanley Field.

The following subject was then discussed by the members, the discussion being opened by Doctor W. P. Wilson, director of the Philadelphia Museums:

DISCUSSION OF THE ADVISABILITY OF ESTABLISHING A PERMANENT EXHIBIT OF MUSEUM BUILDINGS, FITTINGS AND APPOINTMENTS

Dr. Wilson.—"I will take but five minutes in opening the discussion which is intended to determine whether it is desirable to bring together in some manner, in some one place, a museums of museums, a place where, as far as possible, the literature of museums and the catalogues, that have been published by museums may be found, together with descriptions of museums, plans and blue prints and photographs of both the exterior and interior. More benefit could be derived from an examination of these plans and methods of museum operation than by going to all the museums and seeing the things personally. The object of such an undertaking would be to have a place where the plans would be sufficiently developed to show methods of lighting, arranging cases, and installing exhibits in museums; where there should be brought together an exhibit of cases and models sufficient to show how they are adapted to museum purposes.

"I think any museum which has some advanced method of building cases would be very glad to make a model and show such things fully

enough so that anyone studying the models could get an idea of the method of construction.

"There is also the matter of labels and preservation of specimens and everything of that kind which could be brought together to exhibit museum methods. It is simply a question of whether it would pay to bring that sort of thing together in one place where it would be attractive for persons to come and study it and where they could see, for instance, the plans of the museums in Paris or the New National Museum of the German Empire in Munich, or any other great museum in Europe or the United States. It seems to me that an idea of this kind could be carried out and that there would be no difficulty in finding a museum which would be willing to give the time and space to take care of these things and install them. If there is a desire on the part of this organization to send in material and then, as far as possible, to secure the same material from museums both in Europe and in this country who do not belong to the organization, I have no doubt but that it can be brought about and I will guarantee that such exhibits will be taken care of if they are gotten together in such shape that they can be catalogued and placed on exhibition ready for whoever may come to see them."

Mr. Frank C. Baker (*Academy of Sciences, Chicago*).—"I would like to put this matter in concrete form, and to do that I present the following resolution: RESOLVED, that the American Association of Museums deems it advisable to start a museum of museums, and that each member present representing a museum be urged to send in plans of that museum as extensive as possible to Dr. Wilson, and that the Philadelphia Museums be the designated place to exhibit this collection."

Secretary Rea.—"I take pleasure in seconding Mr. Baker's resolution. I think we ought to be very much indebted to Dr. Wilson for assuming the management of this work, and I do not know of any institution so well adapted to maintain this exhibit as the Philadelphia Museums. It is centrally located, it is doing work which brings it into correspondence with a large part of the world, and I believe we shall find this exhibit of extreme value as the years go by."

Mr. Baker.—"I might add one thing to my resolution, and that is that a circular be prepared by Dr. Wilson and sent to all the museums in the world, requesting them to send in plans illustrating their methods."

After some further discussion, the question was called for and being put to a vote, Mr. Baker's resolution was unanimously adopted.

Dr. Wilson.—"I wish to appeal to every person here to send me at once material and labels in duplicate sets. If a museum anywhere

wishes to see sets of labels and I have them in my possession from forty museums I will send them out and pay the expenses of sending them, and then they can be returned to me. I will take charge of that sort of thing, or any other samples you may send, and I hope you will be active in sending in everything you have, good, bad, and indifferent, two samples of everything you forward me."

Dr. Oliver C. Farrington, Curator of Geology, Field Museum of Natural History, then presented the following paper:

THE GEOLOGICAL COLLECTIONS OF THE FIELD MUSEUM OF NATURAL HISTORY

The geological collections of the Field Museum of Natural History represent the earnest effort of fourteen years to gather material having both scientific value and popular interest. Some account of progress made and information gained in this work during this period may be of value.

The collections had their origin largely in material obtained from the World's Columbian Exposition and were chiefly from two sources; one, the geological portion of the natural history collection prepared by Ward's Natural Science Establishment, and the other, donations made by exhibitors in the Department of Mines and Metallurgy. An economic and systematic division of the collections was thus indicated by the two sources of origin, and this has been maintained to a greater or less degree in the subsequent development of the collections. The material obtained in 1894 was assigned to the west wing of the present museum building and filled 21 halls. The distribution adopted at that time was the following: Paleontological collections, three halls; relief and other maps, two halls; meteorites, one hall; minerals, two halls; structural geology, one hall; lithology, one hall; marbles and building stones, two halls; coal, two halls; petroleum, one hall; ores of the precious metals, one hall; ores of the base metals, two halls; clays, one hall; metallurgy of iron, one hall; and non-metallic minerals, one hall. The paleontological collections numbered about 10,000 specimens; meteorites 180; minerals 5000; structural geology 500; lithological specimens 1500; and the economic collections as a whole about 20,000 specimens.

The cases available for the collections at the opening of the Museum were largely obtained from the Exposition and, it may be said, were not intended for permanent use.

The systematic collections at the beginning were as a whole extensive and comprehensive. The paleontological collections were especially strong in Silurian invertebrates, European ichthyosaurs, Solenhofen fossils and French Tertiary invertebrates. The collections contained, however, numbers of casts which while theoretically instructive have practically been found to have an unfavorable effect upon the average museum visitor. The satisfaction which the visitor feels in being confident that he is seeing a real article seems to outweigh any instruction which he might derive from looking at a cast. Accordingly the casts have been largely eliminated and genuine specimens supplied wherever possible.

The chief additions which have been made to the paleontological collections have been American vertebrate fossils, there being none of these of importance in the collection at the time it was started. Representative specimens of the wonderful extinct reptilian and mammalian faunas for which our country is justly famous are now possessed, the material having been obtained chiefly by a series of expeditions to South Dakota, Montana and Colorado. This material is found to possess not only scientific interest and value but also as a rule an interest for the average visitor. Considerable material new to science has been obtained in the course of these explorations and the collection includes many types. An especially important specimen is the great Dinosaur skeleton now being erected, which was obtained in Colorado in 1901. Not only is this one of the largest individual Dinosaurs ever discovered, but it contains more bones of a single individual than any such Dinosaur yet mounted. Moreover from the completeness of the vertebral column a correct conception of the proportions of these animals was obtained for the first time, previous reconstructions having been based on incomplete vertebral columns and the animal made too long. Other especially important specimens are the huge skull of Triceratops or great horned lizard which was obtained in Montana in 1904 and which is the largest skull of this genus known; portions of the skeleton of an extraordinary giraffe-like Dinosaur, one bone of which is the largest known to science; and the most complete skeleton known of a genus of Pterosaurs or flying lizards. Considerable additions to the series of invertebrate fossils have been made by field collecting, purchase and exchange. Among these the Devonian invertebrates, Burlington crinoids and Silurian sponges are of especial importance. The local fossil fields have also been extensively explored and numerous new forms discovered.

The collection of meteorites, which contained representatives of 180

falls at the beginning, has been increased so that one-half of the total number in the world, or 300 falls, are now represented. Several of these falls, such as Long Island, Brenham, Forest City, Saline and Kenton County, have their largest representation here and the specimens are of priceless value. This collection has always been one that has attracted much popular interest.

The collection of minerals was at the beginning fairly representative of the different mineral species and localities though some important ones were not illustrated. Especially satisfactory series were those of sulphur from Sicily, fluorite from England, agate from Uruguay, calcite from England, topaz from Russia, apatite from Canada and barite from England. The collection has been continually increased by field work exchange and purchase, so that it is now more than double its size at first and most of the mineral species and localities of the world are represented. An especially important addition was obtained by acquisition of the collection of Maynard Bixby of Salt Lake City. This comprised 2400 specimens, chiefly from little known mining districts of the West and afforded a considerable quantity of material not represented in any other collection. Public interest in the mineral collection as a whole may be said to gravitate chiefly to the gem stones, but systematic studies of the collection are made by classes from the public schools and universities and prove its instructiveness beyond a doubt.

The collection illustrating structural geology possessed at the beginning remarkable specimens in the way of large slabs of ripple marks, large concretions, septaria, glaciated surfaces, basalt columns, and series of volcanic products. A special addition has been made by procuring large quantities of cave material from Mammoth, Wyandotte and other caves and much of this has been mounted realistically. The collection of concretions has also been much extended. Other structural types represented are veins, faulting, folding, erosion forms, dendrites, stratification, jointing and various rock textures.

The lithological collection comprises, as at the beginning, the better known rock types. These number about 2000 specimens. Such a collection cannot be expected to be of especial interest to the general public, but many consult it who desire to become familiar with the different rocks so as to distinguish them in the field.

The collection of relief and other maps has from the first proved of much public interest and instructiveness. The influence of relief upon climate, rainfall, commerce, industry, commercial and racial development are all illustrated by these maps. The origin and history of

scenic features such as those of Niagara Falls, Yosemite Valley and the Grand Canyon of the Colorado are also illustrated and a broader and more intelligent interest in these natural wonders aroused. Ideal maps illustrate the origin of single natural features, such as the formation of a valley, a glacier, a steep and dune coasts, etc. Especial attention has been paid to illustrating the influence of relief upon the development of our own country and many maps contribute to this end. So far as possible it has been deemed desirable to supplant the map representation of a region by photographs and this is rapidly being accomplished. Not only are features of the earth represented but the relief of the moon is also shown by an accurate hemispherical map nineteen feet in diameter. Whether Mars will be added to the series depends on future developments. A total of sixty-seven relief maps, seven ordinary maps and twenty-five framed photographs at present forms the collection.

The economic material acquired from the Exposition naturally included many trophies and more or less matter of transient interest. The first work undertaken so far as this material was concerned therefore had largely to do with reducing the trophic exhibits to permanent museum form. Marble and other pyramids were converted to slabs and specimens of uniform size, coal and stone blocks cut down and duplicates of all kinds separated. The collection then comprised large series of ores of the different metals from most of the important mining regions of the world, illustrations of a large number of metallurgical processes and collections of clays, marbles, building stones, coal, petroleum and salts illustrating the character and origin of these important economic products.

The task for the future in connection with these collections seemed to be, in addition to a scrupulous care of the material already on hand, their extension, by including more specimens of the products of the mines and quarries of the world and illustrations of the extraction, preparation and use of these products. While this plan has been in general pursued, certain considerations have developed in the course of the work which deserve mention. It has been found that to a certain extent economic and scientific values differ. Economic values are more relative than scientific values. The interest in a mineral species remains about the same from year to year, but the economic interest of a mine ceases when its product is dug out. Hence specimens from a large number of mines and quarries economically considered have a more or less temporary value. This is not saying that they do not have historical and scientific value, for this

they undoubtedly do have, but a collection exhibited for economic instructiveness alone must undergo frequent change. The scientific museum it would seem therefore should rather endeavor to procure typical ores illustrating well-known regions than specimens from many mines as such. A similar difficulty was found to characterize exhibits of metallurgical processes. Scarcely one of the processes received in illustrated form from the World's Columbian Exposition is in use in the same form today. If therefore space is lacking to exhibit such a process for its historical interest, it must be discarded and new ones be continually put in place, in order to successively illustrate modern practice. To do this for many processes would leave time for little else. The plan adopted has been therefore to exhibit a few standard typical processes only.

A striking change chronicled in the growth of the economic collections in the period under consideration has been that of the greater importance now attached to the non-metallic products. Fourteen years ago the different salts, abrasives, refractory products, pigments and even clays were hardly considered worthy a place in an exposition or museum. Now, however, such materials form a large and important part of any collection of economic minerals.

Another collection found to possess general interest, which has been added since the collections were first organized, is one illustrating different kinds of soils, their origin and composition. The collection of clays has been much enlarged in the period under consideration, so that more than 400 localities and varieties are now illustrated. The value of this collection has been considerably increased by preparing briquettes of each clay to show the relation of the burned and raw products. The collection illustrating varieties of marble according to color, pattern and locality, is, as now composed, probably the largest of its kind in the world, about 400 specimens being exhibited in slabs 9 x 15 inches in size. A feature of especial interest from the first in the coal exhibit has been a large plate glass map, 17 x 30 feet in size, received from the Department of Mines of the World's Columbian Exposition. On this are shown the coal fields of the United States. This map never fails to interest visitors, partly probably, because its size and position, level with the floor, give it a realistic effect, and partly because of the inherent interest attaching to the origin of coal. The collection of petroleum, illustrating varieties, processes of refining and products, has also always proved of much interest.

In pursuit of materials desirable for the collections the various expositions of Omaha, Nashville, Paris and St. Louis have been visited and

much that was important obtained. Requests for material at these expositions have always been met with the utmost courtesy and exhibitors have usually shown a desire to further as much as possible the aim of the Museum to build up large and representative collections. Special field trips made from time to time have afforded especially complete collections along certain lines, such as the zinc and lead ores of the United States, Mexican ores, graphites and clays.

To sum up: The present geological collections as compared with those possessed fourteen years ago, while occupying the same number of halls, have been more than doubled in number of specimens and the proportion of material has been changed somewhat. At the present time six halls are devoted to paleontology instead of three; two to relief maps; one to meteorites; two to minerals; one to structural geology; one to lithology; one to marbles and building stones; one to clays; two to coal one to petroleum; one to ores of the precious metals; two to ores of the base metals; and one to non-metallic minerals. The paleontological collections number about 30,000 specimens, the mineralogical and other systematic collections 15,000, and the economic collections 25,000. Substitution of permanent cases for temporary ones has been accomplished in part and this work is still going on. The economic collections are probably of their kind the largest in the world, and the systematic collections comprise much unique and valuable material affording foundation for further growth.

Mr. Alfred Emerson of the Art Institute, Chicago, then presented the following paper:

A PLEA FOR THE BETTER RECOGNITION OF CHRISTIAN ARCHÆOLOGY

In museums of sculpture all over the world at the present time, we find the history and development of ancient sculpture more or less abundantly illustrated, from the royal pyramid builders of Egypt to the age of the Antonines. There is a continuous gallery of antique sculpture all the way from the successors of Men, about 3600 B. C., to Marcus Aurelius and his more immediate successors, in the second half of the second century after Christ and the first quarter of the third.

In the Art Institute of Chicago, for example, our earliest statue,

represented in the plaster cast, is one of Chephren, the builder of the second pyramid at Gizeh. The latest imperial portrait in the Roman Sculpture Room is a copy of the London Caracalla. At this point in the historic evolution of the sculptural art we encounter a prodigious gap of eight whole centuries before the Chicago gallery illustrations of mediæval art, of Romanesque and Gothic architecture and sculpture begin. They do so nobly enough, with two French church portals of the XI century at St. Gilles and Clermont-Ferrand. French Renaissance architecture and sculpture are liberally illustrated in the same hall, the Italian Renaissance in another big room, XVIII and XIX century Italian, French and English, Danish, Swedish and American sculpture in two others. The Ghiberti to St. Gaudens series follows the ancient oriental and classical series abruptly, without explanation or transition. Boston and New York, London, Paris and Berlin have hardly accorded better practical recognition to Christian archæology in their relatively larger antique cast collections.

How true an index of the prevailing indifference to early Christian monuments this is may be gathered from the fact that only one of the twelve extant specimens of good-sized early Christian statuary has even been molded. That one, as it happens, is a marble statue of Julian the Apostate in the Louvre Museum, Paris, certainly not a Christian emperor whom the early Christians themselves would have delighted to honor. The pagan archæologists who sometimes control the formation of our cast collections seem to have proclaimed an actual boycott against Christian art. The uncouth and dependent, but surely not spiritless, efforts of the early Christian builder, image-carver and painter find no grace in their eyes.

Time was, to be sure (down to and including the first Empire and the French Restoration), when Winckelmann and Goethe, Canova and Visconti ruled the firmament of art and art criticism. Those ardent worshippers of the antique thought little of Christian art in any form. But no such hostility exists now. The romantic movement of the XIX century replaced the dethroned muses of Christian art and of mediæval literature in temples of honor. Goethe, the ultraclassicist, lived to write the Teutonic, mediæval mystery of Faust.

The new movement was duly followed or repeated in the gallery and museum world. It was only natural that practical assimilation should lag many years behind the original impulse. The neglect of the feeble infancy and adolescence of the new Christian art, which we have noted in our public art collections, is in fact no bigoted blindness to its value and

import on the part of scholars. It is merely a case of uncompleted educational development.

Fifteenth century France inaugurated the use of plaster casts for purposes of art education. King Francis I engaged the Italian painter Primaticcio to secure a plaster copy of the big equestrian statue of Marcus Aurelius, on the Capitoline Mount, and transport it to Paris. This plaster horseman was set up out of doors, in one of the open quadrangles of the Louvre Palace. That enclosure, in consequence, retained the name of White Horse Court (La cour du cheval blanc) for many years, even after the plaster monument crumbled away and was removed.

So much of this Parisian statue of Marcus Aurelius. But is it not singular that modern classical scholarship and art education have almost universally accepted the reign of this very Roman emperor, or more generally speaking the age of the Antonines, as the last station of antique art deserving serious notice? I must refer you to Mrs. Arthur Strong's brilliant volume on Roman Sculpture, a work published only two years ago, for the first fruits of the critical secession. Mrs. Strong has drawn the teeth of the old dogma that Roman art was a colorless and spiritless rehash of Greek models, and ceased to deserve notice, even on that score, with the close of the second century. The progress of the earlier scholarly criticism, and the popular assimilation of ancient art history were chiefly a backward advance. We passed from the later Roman empire to the early, from the Augustan age to Hellenistic age, from that period's Laocoön and Venuses of the Medici and of Melos to the ages of Praxiteles and Phidias, and from these classical Greek masters to the obscure origins of Greek art. We took our leap, thence, into the even more fascinating obscurities and mysteries of the Persian, Hittite, Mesopotamian and early Egyptian civilizations, as we saw them reflected in oriental painting, sculpture and architecture. And at the end of our scholarly progress we faced the Sphinx itself, and found no answer.

At a later stage, the École des Beaux Arts and South Kensington helped teach us to know and to recognize the mastery in sculpture of Michelangelo and Donatello. From these points of repair the educational apprehension of modern art has made a further advance, backwards, to the beauties of Gothic and Romesque architecture and sculpture, and forwards to the wonders of XVII, XVIII, and XIX century plastic art. It is only fair to link this movement of expansion with the name of Viollet le Duc, and of his posthumous creation, the Musée du Trocadéro.

Whatever belongs between A. D. 200 and 1000 is still systematically ignored in our public art galleries, both abroad and at home. We have

already noted the fact that only one early Christian sculpture of any size has been molded, and can be had in the cast market at the present time. No stronger proof of my statement can be offered. A Russian writer, Merejovski, has made Emperor Julian the hero of a picturesque novel called "The Death of the Gods." But one feels keenly the anomaly of having to make this particular Roman prince, whom we certainly cannot admire in our capacity as Christians, the *pièce de résistance* of a section, cabinet, or museum of Christian antiquities!

The coöperation of many museums is needed to lift the veil that now curtains the later Roman and early Christian ages. Let the general public have a glimpse of the stirring times of the Severi, of the soldier emperors Aurelian and Claudius Gothicus, and of Constantine and Justinian. The energy and distinction of the later imperial portraiture deserves a finer unfolding than it has had. Witness, for example, the Vatican's noble busts of Emperors Pupienus and Philip, or Duke Tonlonia's splendid marble portraits of Emperors Maxentius and Magnentius and of Constantine's wife Fausta. Why are casts of the arch of Trajan to be seen only at Chicago and Princeton, one of the column of Trajan only at Saint-Germain and Berlin, a cast of the column of Marcus Aurelius only at Berlin, a model of the arch of Constantine only at the Metropolitan Museum of New York City? Why should Liverpool and South Keningston have a monopoly of Roman consular diptychs, and of other fascinating pagan and Christian ivory carvings, when it is so easy to get those ancient treasurers faithfully reproduced from Messrs. Elkington and Company's guttapercha molds?

Does it seem credible that not one specimen of a hundred Christian sarcophagi at Rome, Syracuse and Ravenna, at Arles and Toulouse, or in Spain, French Africa and the Levant has ever been molded?

The porphyry sarcophagi of Constantine's mother, St. Helen, and of his daughters are in the Vatican Museum. Marble ones of the Christian emperors Honorius and Constantius and of the Empress Galla Placidia adorn one of the Ravenna churches. The Parian marble sarcophagus of Consul Junius Bassus in the crypt of St. Peter's is carved with ten Biblical subjects, extending from Adam and Eve in the garden of Eden to a Christ in glory who plants his feet on the Roman sky-god Cælus. The inscription on the Vatican crypts marble recites that Junius Bassus was Prefect of Rome, and died in the year 359 after Christ. We know from other sources that he was the dedicator under Constantine of a public hall which Pope Simplicius was able to dedicate as a church about A. D. 471. The building in question is now destroyed; but the Renaissance

architect Sangallo's drawings of it on parchment are preserved in a Roman library.

A well-stocked section of Christian art, in a gallery of the history of sculpture, ought to show copies of ten or twelve early Christian sarcophagi to illustrate the principal types and subjects of those splendid monuments of the early Church. Classical scholars may be forgiven a smile in the Lateran Museum, when they see Andromeda's sea-monster doing duty as the whale of the prophet Jonah, or Jonah himself, reclining under his pumpkin-vine, borrow the form and pose of the Grecian shepherd Endymion, the beloved of the moon-goddess. The same habit of contaminating pagan ideas with Christian led the mural mosaic setters of Byzantium to depict the essentially pagan river-god Jordan as witnessing the baptism of Jesus in his own current. Other mosaic paintings oppose a personified Hades to the Savior in limbo. We smile at these classical reminiscences, but the simplicity, the innocence and the reverent feeling of early Christian carvings and pictures would possess a strong interest for the everyday churchgoer and Sunday-school pupil, no less than for sculptors, architects, decorative designers, and the gifted art critic who is always with us. I want my children to find something they can understand without being lectured at, even on the ground floor of an art museum.

Now I fear it would take me long to describe the varied interest of old Christian and of early Byzantine ivory carvings, minor statuary, woven and embroidered stuffs, of church utensils, illuminations on parchment, gold-leaf pictures under glass, of ecclesiastical frescoes and mosaics, and of all the other products of sacred art. But I shall bespeak your indulgence a moment longer for a short account of early Christian statuary and of its favorite subjects. Because all of it that has survived can be enumerated on ten fingers, and is withal tolerably characteristic of the opportunities which the neglected field of the older religious art holds open to museum directorates.

Christianity in Rome dates from the first century. One of the Roman catacombs dates from the second. The oldest Christian statues have been found in third century catacombs. The Good Shepherd of the parable, with a rescued sheep on his shoulders, was one of the favorite subjects of the early converts to Christianity. Their sculptors appear to have portrayed the Savior of mankind principally under this light veil of disguise. Five statuettes of the Good Shepherd are preserved in the museums of Rome, Constantinople and Athens. The Shepherd is in each of these variously mutilated figures a beardless boy with long curls

falling to his shoulders, and wears the purely classical, Græco-Italic tunica exomis, a tunic, that is to say, which is clasped only on one shoulder. In addition to this light coat of the working classes, the shepherd lad wears high, rustic boots, and carries a stick to throw at rabbits, and a pouch. This mode of representing the Redeemer affects us rather strangely at first. And the early Christian artists' mastery of form is far from perfect. The true charm of the better examples of the Good Shepherd motive resides in a note of childlike sweetness. The Garrett Biblical Institute at Evanston, Illinois, is now elaborating tentative purchase-lists for a Museum of Christian Archæology which it will consecrate to the memory of the late Professor Charles Bennett. It hopes to recognize the deeply religious spirit and the dignity of the antique figure of the Good Shepherd by having the best of the three replicas of it at the Lateran Museum copied in marble rather than in plaster of Paris.

A second III century statue from the catacombs is of less manifestly Christian subject and execution. It is a seated portrait of St. Hippolytus, a dissident Greek father of the old Roman church. But we should be unable to distinguish the Lateran Hippolytus from any Roman patrician without the convincing evidence of the Greek inscription at one side of the marble. It gives a list of the Greek father's writings, and a table of his system for determining Easter.

The IV century has left us five marble statues of secular character. Two of them, in the Capitoline museum, represent an elderly and a young Roman Consul; another, in the Museo delle Terme, is the portrait of a togate magistrate. I have already touched upon the two statues of Emperor Julian in the habit of a crowned philosopher which were found in the ruins of a Roman Imperial palace on the left bank of the Seine. It will be remembered that Julian's turbulent legions proclaimed him Emperor at Paris. A colossal bronze statue of Theodosius stands on the quay at Barletta, Apulia; but it will be out of the question to procure a cast of this contemporary portrait and monument of the united Roman Empire's last sovereign, on account of its inordinate size.

Our next and last specimen of the oldest ecclesiastical statuary is the familiar bronze figure of St. Peter in the great church of that saint in Rome. Scoffers used to assert that this ancient relic of the early Church is the purely pagan portrait statue of some Roman Consul, or worse yet, of a Jupiter Capitolinus. Its purely Christian origin and subject are in reality unquestionable. The Roman statue of St. Peter, prince of apostles, was probably cast at Constantinople, under and for Emperor

Leo I, in the year 451 after the birth of Christ. It will be no light matter, I apprehend, to obtain the Vatican's permission to take a mold of this peculiarly sacred sculptured relic of the IV century Christian world. And with it my unfortunately exhaustive statistic of the III, IV and V century Christian statues so far recovered is at an end.

One sympathetic portrayal of Our Savior, one counterfeit presentment of an apostle, one Church Father, two Roman consuls, and the portrait figures of two renowned Roman emperors of the post-Constantinian age are no mean patrimony for the future halls and cabinets of the earliest Christian sculpture in our public and collegiate galleries of history and art to draw upon.

And now, in conclusion, I heartily invoke the practical coöperation of other museums, and of their generous supporters, in according full recognition to early Christian art documents. I feel sure that in so doing they will be acting not only for the benefit of the Garrett Biblical Institute's public-spirited project, but for the lasting advantage of the responsive American public. I wish I might persuade several American museums to place one or more orders for good casts and electrotype copies of the leading early Christian heirlooms, and for good models and details of old Christian architecture, at once. It were an ungallant thing to let the pioneer gallery of Christian antiquities in our part of the world—I had almost said in any part of the world—wrestle with the disproportionate first cost of getting inedited material properly copied alone.

President French.—"I feel my sands running out as president, and I wish to say that I have felt very much honored by being allowed to hold this office for one year. We have been most heartily glad to have the Association here, and we hope that the revolving years will bring it at no distant day to us again. In the meanwhile, we look forward with enthusiasm to the meetings at Philadelphia and Buffalo."

On motion of Mr. A. R. Crook, Curator, Museum of Natural History, State of Illinois, Springfield, the Association then adjourned to meet at Philadelphia at a date to be fixed hereafter by the Council.

APPENDIX

CONSTITUTION OF THE AMERICAN ASSOCIATION OF MUSEUMS

ARTICLE I

NAME

The name of this Association shall be "The American Association of Museums."

ARTICLE II

OBJECT

The object of this Association shall be to promote the welfare of Museums, to increase and diffuse knowledge of all matters relating to them, and to encourage helpful relations among Museums and those interested in them.

ARTICLE III

MEMBERSHIP

All Museums officially represented at the first meeting of this Association, held at the American Museum of Natural History in New York, on May 15, 1906, all persons taking part in the organization of this Association, or who on the above date, or prior thereto, have by letter signified their wish to become members of the Association, shall become Charter Members on payment before the next annual meeting of the Association of the fees hereinafter provided for.

The Members of the Association shall be Active, Associate, Sustaining, and Honorary.

Persons actively engaged in the work of Museums may become Active Members on the payment of two dollars per annum, and may become Active Members for Life upon payment of thirty dollars at any one time.

Persons not actively engaged in the work of Museums, contributing five dollars per annum, may become Associate Members.

Each Museum paying not less than ten dollars a year shall be a Sustaining Member of the Association, and through its chief executive officer, or a properly accredited representative, shall be entitled to cast a vote on all matters coming before the Association.

Persons distinguished for eminent services, either to the cause of Museums or to this Association, may become Honorary Members. The number of Honorary Members shall be limited to fifteen. When ten Honorary Members have been elected then thereafter not more than two such members may be elected annually.

Active and Sustaining Members only shall have a right to vote, and Active Members only may hold office.

Any Museum or person proposed in writing for Active, Associate, or Sustaining Membership by a Member of the Association, and approved by the Council, upon the payment of the proper fee shall become a Member of the Association.

Any person contributing five hundred dollars or more at any one time shall become a Patron of the Association.

ARTICLE IV

OFFICERS

The officers of the Association shall be a President, two Vice-Presidents, a Secretary, and a Treasurer, and six other persons designated as Councillors, and these eleven shall constitute the Council. The President and two Councillors chosen by the Association shall retire annually, and for one year shall be ineligible for reëlection to the same office.

ARTICLE V

COUNCIL

The general control of the affairs of the Association, except as otherwise herein provided, shall be vested in the Council.

ARTICLE VI

ELECTION OF OFFICERS

Officers shall be elected by ballot at the annual meeting.

The Council shall have power to fill any vacancies which may occur in its membership between annual meetings.

ARTICLE VII

MEETINGS

A general meeting shall be held in each calendar year. Special meetings may be appointed by the Association or called by the Council. The time and place of the annual meeting shall be determined by the Association. In order to diffuse a knowledge of Museums and their work, the Association shall meet in a different city or town each succeeding year, unless otherwise determined by the Association.

At the annual meeting papers may be read, matters relating to Museums discussed, and any business relating to the affairs of the Association shall be transacted.

Special meetings may be called by the Council in emergencies, and only matters stated in the call shall be considered at such special meetings.

REPORT OF THE TREASURER OF THE AMERICAN ASSOCIATION OF MUSEUMS, PRESENTED AT THE ANNUAL MEETING, CHICAGO, MAY 5–7, 1908

Balance on hand at meeting, June 4, 1907 ..... $472.70

RECEIPTS.

19 Active membership fees for year ending May 15, 1907	38.00
82 Active membership fees for year ending May 15, 1907	64.25
3 Active membership fees for year ending May 15, 1909	6.00
1 Active membership fee for year ending May 15, 1910	2.00
2 Sustaining Memberships for year ending May 15, 1907.....	20.00
17 Sustaining Memberships for year ending May 15, 1908.....	170.00
Life Memberships:	
1 at $30..... $30.00	
Balance due from transfer from sustaining to life membership..... 20.00	
	50.00
Sale of publication.....	1.00
Donation of W. J. Holland.....	200.00
Total.....	$1123.95

EXPENDITURES.

1907			
July 16	To bill H. C. Bumpus	$7.00	
July 6	To Philadelphia Museums	2.50	
Aug. 9	To postage stamps	3.00	
Aug. 19	To Philadelphia Museums	2.30	
Aug. 7	To P. M. Rea, Secretary	5.30	
Jan. 27	To John C. Bragdon	35.10	
1908			
Mar. 31	To W. J. Holland.....	14.24	
Apr. 7	To New Era Printing Co.....	386.57	
Apr. 7	To W. J. Holland	2.68	
Apr. 15	To Philadelphia Museums.....	2.50	
Apr. 28	To Postage Stamps.	3.00	
Apr. 29	To Wm. H. Hoskins Co	5.25	
May 1	To Wm. H. Hoskins Co	1.00	
			470.49
Balance in treasury, May 2, 1908.....			$653.46

W. P. WILSON,
Treasurer.

Examined and found correct:
O. C. FARRINGTON,
FRANK C. BAKER,
N. H. CARPENTER,
Auditing Committee.

MEMBERS OF THE AMERICAN ASSOCIATION OF MUSEUMS[1]

LIFE MEMBERS

The asterisk (*) denotes a Charter Member.

Crook, A. R., Curator, Illinois State Museum of Natural History, Springfield, Ill.
*Hall, Robert C., Owner, Hall Museum of Anthropology, 240 Fourth Ave., Pittsburgh, Pa.
*Henshaw, Samuel, Curator, Museum of Comparative Zoölogy, Harvard University, Cambridge, Mass.
*Holland, W. J., Director, Department of the Museum, Carnegie Institute, Pittsburgh, Pa.
*Minot, Charles S., Harvard Medical School, Boston, Mass.
*Talmage, James E., Director, The Deseret Museum, Salt Lake City, Utah.

ACTIVE MEMBERS

*Adams, Charles C., University of Chicago, Chicago, Ill.[2]
*Akeley, C. E., Taxidermist-in-Chief, Field Museum of Natural History, Chicago, Ill.
*Allen, J. A., Curator of Mammalogy and Ornithology, American Museum of Natural History, New York, N. Y.
*Ami, Henry M., Geological Survey of Canada, Ottawa, Canada.
Atkinson, D. A., Honorary Custodian of Reptiles and Amphibians, Carnegie Museum, Pittsburgh, Pa.
*Baker, Frank C., Curator, The Chicago Academy of Sciences, Lincoln Park, Chicago, Ill.
*Barber, Edwin Atlee, Curator, Pennsylvania Museum and School of Industrial Art, Memorial Hall, Fairmount Park, Philadelphia, Pa.
*Barbour, Edwin Hinckley, Curator of the State Museum and State Geologist of Nebraska, Lincoln, Neb.
*Beckwith, Paul Edmond, Assistant Curator, Division of History, National Museum, Washington, D. C.[3]
Beatty, John W., Director, Department of Fine Arts, Carnegie Institute, Pittsburgh, Pa.
*Bennett, Miss Bessie, Assistant to the Director, The Art Institute of Chicago, Chicago, Ill.
*Berg, George L., Director, Washington State Art Association, Seattle, Wash.

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[1] The following list has been furnished by the Treasurer, Dr. W. P. Wilson, and includes the names of all whose applications for membership were approved by the Council down to May 7, 1908, and who have qualified by payment of dues.

[2] Present address: Natural History Building, University of Illinois, Urbana, Ill.

[3] Died, June 27, 1907.

Beutenmüller, William, Curator, Department of Entomology, American Museum of Natural History, New York, N. Y.

Bibbins, Arthur Barnweld, Director of the Museum, Woman's College, Baltimore, Md.

Blackman, Elmer Ellsworth, Archæologist, Nebraska State Historical Society, Lincoln, Neb.

*Brigham, William T., Director, Bernice Pauahi Bishop Museum, Honolulu, H. I.

*Britton, N. L., Director-in-Chief, New York Botanical Garden, Bronx, Park, New York, N. Y.

Brown, Arthur Erwin, Curator, Academy of Natural Sciences; Director, Zoölogical Gardens, Philadelphia, Pa.

Brues, Charles Thomas, Curator of Invertebrate Zoölogy, Milwaukee Public Museum, Milwaukee, Wis.

*Bryan, William Alanson, President, Pacific Scientific Institution, Honolulu, H. I.

*Bumpus, Hermon C., Director, American Museum of Natural History, New York, N. Y.

*Burchard, Edward L., Museum Extensionist, Freeport, Ill.

Burkholder, C. H., Assistant to the Director, The Art Institute of Chicago, Chicago, Ill.

Carpenter, Newton H., Secretary, The Art Institute of Chicago, Chicago, Ill.

*Clarke, Sir Casper Purdon, Director, Metropolitan Museum of Art, New York, N. Y.

Coggeshall, Arthur S., Preparator-in-Chief, Department of Paleontology, Carnegie Museum, Pittsburgh, Pa.

*Collie, George L., Curator, Logan Museum, Beloit College, Beloit, Wis.

Comfort, George F., Director, Syracuse Museum of Fine Arts, Syracuse, N. Y.

*Comparette, T. Louis, Curator, Numismatic Collection, United States Mint, Philadelphia, Pa.

Corliss, George, Assistant to the Director, The Art Institute of Chicago, Chicago, Ill.

Cory, C. B., Curator of Zoölogy, Field Museum of Natural History, Chicago, Ill.

Covert, Adolphe Boucard, Curator, University of Cincinnati Museum, Cincinnati, Ohio.

Dahlgren, B. E., Assistant Curator of Invertebrate Zoölogy, American Museum of Natural History, New York, N. Y.

*Dean, Bashford, Curator of Fossil Fishes, American Museum of Natural History; Curator of Arms and Armor, Metropolitan Museum of Art, New York, N. Y.

*de Forest, Robert W., Trustee and Secretary, Metropolitan Museum of Art, New York, N. Y.

*Dorsey, George A., Curator of Anthropology, Field Museum of Natural History, Chicago, Ill.

Douglass, Earl, Assistant in Research Section of Paleontology, Carnegie Museum, Pittsburgh, Pa.

*Dow, George Francis, Secretary and Curator of the Museum, Essex Institute, Salem, Mass.

*Dyche, L. L., Curator of Birds and Mammals, State University, Lawrence, Kansas.

*Eastman, Charles R., Curator of Vertebrate Paleontology, Museum of Comparative Zoölogy, Harvard University, Cambridge, Mass.

*Eigenmann, Carl H., Professor of Zoölogy and Dean of the Graduate School, Indiana, University, Bloomington, Ind.

Emerson, Alfred, Acting Director, Bennett Museum of Christain Archæology, Garrett Biblical Institute, Evanston, Ill. Address: The Art Institute of Chicago, Chicago, Ill.

Failing, Henriette H., Curator, Portland Art Association Museum of Art, Portland Oregon.

Fairbanks, Arthur, Director, Museum of Fine Arts, Boston, Mass.

*Farrington, Oliver C., Curator of Geology, Field Museum of Natural History, Chicago, Ill.

Fisher, Fannie, Assistant Curator, Illinois State Museum of Natural History, Springfield, Ill.

Foulke, J. B., Administrative Assistant, American Museum of Natural History, New York, N. Y.

*Fox, William Henry, Director, John Herron Art Institute, Indianapolis, Ind.

*French, William M. R., Director, The Art Institute of Chicago, Chicago, Ill.

*Gallup, Anna Billings, Curator, The Children's Museum, Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*Gest, J. H., Director, The Cincinnati Museum Association, Cincinnati, Ohio.

*Gilman, Benjamin Ives, Secretary, Museum of Fine Arts, Boston, Mass.

Glenk, Robert, Secretary, Louisiana State Museum, New Orleans, La.

Glenn, L. C., Vanderbilt University Museum, Nashville, Tenn.

Goodale, George Lincoln, in charge Harvard Botanical, Harvard University, Cambridge, Mass.

*Goodyear, William H., Curator of Fine Arts, Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*Gordon, G. B., Curator, Section of Ethnology, Free Museum of Science and Art, Philadelphia, Pa.

Grant, U. S., Curator, Museum of the College of Liberal Arts, Northwestern University, Evanston, Ill.

Greenman, Jesse M., Assistant Curator of Botany, Field Museum of Natural History, Chicago, Ill.

*Greenman, Milton J., Director, The Wistar Institute of Anatomy, Philadelphia, Pa.

*Griffin, Delia Isabel, Director, The Fairbanks Museum of Natural Science, St. Johnsbury, Vt.

*Griffith, A. H., Director, Detroit Museum of Art, Detroit, Mich.

Gueret, E. N., Assistant Curator, Division of Osteology, Field Museum of Natural History, Chicago, Ill.

*Hall, Christopher W., Curator, Geological Museum, University of Minnesota, Minneapolis, Minn.

Hartman, C. V., Curator, of Archæology and Ethnology, Carnegie Museum, Pittsburgh, Pa.

Hastings, George T., Assistant Curator, Philadelphia Museums, Philadelphia, Pa.

*Henderson, Junius, Curator of the Museum, University of Colorado, Boulder, Col.

*Hitchcock, Charles H., Curator, Butterfield Museum, Dartmouth College, Hanover, N. H.

*Hollick, Arthur, Curator, Department of Fossil Botany, New York Botanical Garden, New York, N. Y.

Hooper, Franklin W., Director, The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*Hopkins, Anderson H., Librarian, Carnegie Library, Pittsburgh, Pa.

*Hornaday, William T., Director, New York Zoölogical Park, New York, N. Y.

*Houston, S. F., President, Department of Archæology, University of Pennsylvania, Philadelphia, Pa.

*Hovey, Edmund Otis, Associate Curator, Department of Geology, American Museum of Natural History, New York, N. Y.

Howe, Marshall A., Curator of the Museum, New York, Botanical Garden, New York, N. Y.

Hyett, William James, in charge of Paintings, Department of Fine Arts, Carnegie Institute, Pittsburgh, Pa.

Ives, Halsey C., Director, Museum of Fine Arts, St. Louis, Mo.

*Jenkins, L. W., Curator of Ethnology, Peabody Museum, Salem, Mass.

Jennings, Otto E., Assistant Curator of Botany, Carnegie Museum, Pittsburgh, Pa.

Jennings, Mrs. Otto E., Assistant in Section of Botany, Carnegie Museum, Pittsburgh, Pa.

*Johnson, Charles W., Curator, Boston Society of Natural History, Boston, Mass.

Jones, Lynds, Curator of the Museum, Oberlin College, Oberlin, Ohio.

*Kahl, Paul Hugo Isidor, Custodian, Entomological Museum, Carnegie Institute, Pittsburgh, Pa.

Katzenberger, George A., Curator, Museum of Carnegie Library, Greenville, Ohio.

Kent, Henry W., Assitant Secretary, Metropolitan Museum of Art, New York, N. Y.

*Kermode, Francis, Curator, Provincial Museum, Victoria, British Columbia.

Koehler, Robert, Director, Minneapolis School of Fine Arts, Minneapolis, Minn.

*Kunz, George F., Honorary Curator of Gems, American Museum of Natural History, New York, N. Y.

*Kurtz, Charles M., Director, Buffalo Academy of Fine Arts, Albright Art Gallery, Buffalo, N. Y.

*Lamb, Daniel Smith, Pathologist, Army Medical Museum, Washington, D. C.

*Letson, Elizabeth J., Director of the Museum, Buffalo Society of Natural Sciences, Buffalo, N. Y.

*Lindahl, Josua, Late Director of the Museum Cincinnati Society of Natural History, Cincinnati, Ohio.

*Link, Gustave A., Taxidermist, Carnegie Museum, Pittsburgh, Pa.

Lippincott, Elsie, Librarian, Field Museum of Natural History, Chicago, Ill.

Loomis, Leverett Mills, Director of the Museum, California Academy of Sciences, San Francisco, Cal.

*Lucas, Frederick A., Curator-in-Chief, Museums of the Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*McCurdy, George Grant, Curator, Section of Anthropology, Yale University Museum, New Haven, Conn.

Maddox, Robert D., Curator of the Museum, Medical College of Ohio, Cincinnati, Ohio.

Mason, Otis T., Curator of Ethnology, U. S. National Museum, Washington, D. C.[1]

*McGee, W. J. Director, St. Louis Public Museum, St. Louis, Mo.

*McGuire, F. B., Director, Corcoran Gallery of Art, Washington, D. C.

McIlvaine, Mabel, Assistant, Metropolitan Museum of Art, New York, N. Y.

Meek, Seth E., Field Museum of Natural History, Chicago, Ill.

*Mellor, Charles C., Chairman, Committee on the Museum, Carnegie Institute, Pittsburgh, Pa.

Mengel, Levi W., Department of Natural History, Boys' High School, Reading, Ia.

Meyers, Ira B., Curator, School of Education Museum, University of Chicago, Chicago, Ill.

*Mills, William C., Curator and Librarian, Ohio State Archæological and Historical Society, Ohio State University, Columbus, Ohio.

*Miner, Roy W., Assistant Curator of Invertebrate Zoölogy, American Museum of Natural History, New York, N. Y.

*Montgomery, Henry, Curator of the Museum, University of Toronto, Toronto, Ontario.

Moorehead, Warren K., Curator, Department of Archæology, Phillips Academy, Andover, Mass.

Morris, E. L., Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*Morse, Edward S., Director, Peabody Museum, Salem, Mass.

*Morse, S. R., Curator, New Jersey, State Museum, Trenton, N. J.

*Nachtrieb, Henry F., Curator, Zoölogical Museum, University of Minnesota, Minneapolis, Minn.

Nichols, Henry W., Assistant Curator of Geology, Field Museum of Natural History, Chicago, Ill.

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[1] Died, Nov. 5, 1908.

*Nutting, Charles C., Curator, Museum of Natural History, State University of Iowa, Iowa City, Iowa.

Ortmann, Arnold E., Curator of Invertebrate Zoölogy, Carnegie Museum, Pittsburgh, Pa.

Paarmann, J. H., Curator, Davenport Academy of Sciences, Davenport, Iowa.

Perine, Miss Clara N., Assistant to the Director, Wistar Institute of Anatomy, Philadelphia, Pa.

*Peterson, Harry C., Curator, Leland Stanford Jr. Museum, Palo Alto, Cal.

*Peterson, O. A., Preparator of Mammals, Section of Paleontology, Carnegie Museum, Pittsburgh, Pa.

Pollard, Charles Louis, Curator-in-Chief, Staten Island Association of Arts and Sciences, New Brighton, N. Y.

Prentice, Sydney, Artist and Illustrator, Carnegie Museum, Pittsburgh, Pa.

Putnam, Edward K., Acting Director, Academy of Sciences, Davenport, Iowa.

*Putnam, Frederick W., Curator, Peabody Museum, Harvard University; Director, Anthropological Museum, University of California. Address, Cambridge, Mass.

*Rathbun, Richard, Assistant Secretary Smithsonian Institution, in charge U. S. National Museum, Washington, D. C.

*Rathmann, C. G., Director, Educational Museum, St. Louis, Mo.

*Raymond, Percy E., Assistant Curator of Invertebrate Zoölogy, Carnegie Museum, Pittsburgh, Pa.

*Rea, Paul M., Director, The Charleston Museum, Charleston, S. C.

Riggs, Elmer Samuel, Assistant Curator of Paleontology, Field Museum of Natural History, Chicago, Ill.

Robinson, Edward, Assistant Director, Metropolitan Museum of Art, New York, N. Y.

*Rothrock, Boyd P., Curator, Division of Zoölogy, Pennsylvania State Museum, Harrisburg, Pa.

Rothrock, Mrs. Boyd P., Division of Zoölogy, Pennsylvania State Museum Harrisburg, Pa.

Santens, Jos. A., Preparator, Taxidermic Laboratory, Carnegie Museum, Pittsburgh, Pa.

*Santens, Remi H., Preparator, Taxidermic Laboratory, Carnegie Museum Pittsburgh, Pa.

Schoff, Wilfred H., Secretary, The Philadelphia Museums, Philadelphia, Pa.

*Schuchert, Charles, Curator, Department of Geology, Yale University Museum, New Haven, Conn.

Shafer, John A., Custodian of the Museums, New York Botanical Garden, Bronx Park, New York, N. Y.

*Sherwood, George H., Assistant Secretary and Treasurer, American Museum of Natural History, New York, N. Y.

*Skiff, Frederick J. V., Director, Field Museum of Natural History, Chicago, Ill.

Small, John K., Head Curator of the Museums and Herbarium, New York Botanical Garden, Bronx Park, New York, N. Y.

Smith, Lee H., Vice President, Buffalo Society of Natural Sciences, Buffalo, N. Y.

*Smith, T. Guildford, President, Buffalo Society of Natural Sciences, Buffalo, N. Y.

Stewart, Douglas, Assistant to the Director, Carnegie Museum, Pittsburgh, Pa.

*Stone, Witmer, Assistant Curator, Academy of Natural Sciences, Philadelphia, Pa.

Stotsenberg J. McPherson, Curator, Wistar Institute of Anatomy, Philadelphia, Pa.

Swarth, Harry S., Assistant, California Museum of Vertebrate Zoölogy, Berkeley, Cal.

Toothaker, Charles R., Curator, The Philadelphia Museums, Philadelphia, Pa.

*Tower, Ralph W., Curator of Physiology, American Museum of Natural History, New York, N. Y.

*Townsend, Charles H., Director, New York Aquarium, Battery Park, New York, N. Y.

*Townsend, Louis H., Osteologist, Carnegie Museum, Pittsburgh, Pa.

Tuttle, W. F., Administrative Assistant, Art Institute of Chicago, Chicago, Ill.

Van Horne, Mary, Acting Librarian, The Art Institute of Chicago, Chicago, Ill.

*Ward, Henry L., Director, Public Museum of the City of Milwaukee, Milwaukee, Wis.

Webster, Frederick S., Preparator, Taxidermic Laboratory, Carnegie Museum, Pittsburgh, Pa.

Weller, Stuart, Curator, Walker Museum, University of Chicago, Chicago, Ill.

*Wilcomb, C. P., Curator, Hall Museum of Anthropology, Aspinwall, Pa.

*Wilder, Burt Green, Curator, Museum of Vertebrates, Cornell University, Ithaca, N. Y.

*Willoughby, Charles C., Assistant Curator, Peabody Museum, Cambridge, Mass.

*Wilson, W. P., Director, The Philadelphia Museums, Philadelphia, Pa.

*Wissler, Clark, Curator of Ethnology, American Museum of Natural History, New York, N. Y.

Woodruff, Frank M., Ornithologist, The Chicago Academy of Sciences, Chicago, Ill.

Worth, William A., Director, Educational Museum, New York, N. Y.

Zeller, August, Assistant, Department of Fine Arts, Carnegie Institute, Pittsburgh, Pa.

*Zierden, Alicia M., Curator, Division of Education, Pennsylvania State Museum, Harrisburg, Pa.

SUSTAINING MEMBERS

*American Museum of Natural History, 77th St., and Central Park, West, New York, N. Y.
*The Art Institute of Chicago, Chicago, Ill.
*Brooklyn Institute of Arts and Sciences, Eastern Parkway, Brooklyn, N. Y.
*Carnegie Museum, Department of The Carnegie Institute, Pittsburgh, Pa.
*The Charleston Museum, Charleston, S. C.
*The Chicago Academy of Sciences, Lincoln Park, Chicago, Ill.
Cincinnati Museum Association, Cincinnati, Ohio.
*The Corcoran Gallery of Art, Washington, D. C.
*The Deseret Museum, Salt Lake City, Utah.
*The Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
*The Field Museum of Natural History, Chicago, Ill.
*Free Museum of Science and Art, Department of Archæology, University of Pennsylvania, Philadelphia, Pa.
*John Herron Art Institute, Indianapolis, Ind.
*Metropolitan Museum of Art, New York, N. Y.
Museo Nacional de Bogota, Bogota, Colombia.
Museum of the College of Liberal Arts, Northwestern University, Evanston, Ill.
*Museum of Fine Arts, Boston, Mass.
*New York Botanical Garden, Bronx Park, New York, N. Y.
*New York State Museum, Albany, N. Y.
Peabody Museum, Salem, Mass.
*Pennsylvania Museum and School of Industrial Art, Memorial Hall, Fairmount Park, Philadelphia, Pa.
The Philadelphia Museums, 34th St., below Spruce, Philadelphia, Pa.
*Public Museum of the City of Milwaukee, Milwaukee, Wis.
St. Louis Museum of Fine Arts, St. Louis, Mo.
Syracuse Museum of Fine Arts, Syracuse, N. Y.
University of Nebraska, Lincoln, Neb.
Walker Museum, University of Chicago, Chicago, Ill.
*Washington State Art Association, Seattle, Wash.
*Williams College, Williamstown, Mass.

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